Massachusetts Births 2010

Massachusetts Department of Public Health
Bureau of Health Information, Statistics,
Research and Evaluation

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Deval L. Patrick, Governor
Timothy P. Murray, Lieutenant Governor
John W. Polanowicz, Secretary of Health and Human Services
Lauren Smith, MD, MPH, Interim Commissioner of Public Health

Gerald F. O'Keefe, Bureau Director
Bureau of Health Information, Statistics, Research, and Evaluation, Interim Registrar
Registry of Vital Records and Statistics
Bruce Cohen, Director
Division of Research and Epidemiology

Massachusetts Department of Public Health

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Massachusetts Department of Public Health
Bureau of Health Information, Statistics, Research, and Evaluation
250 Washington Street, 6th floor
Boston, MA 02108
or
Massachusetts Department of Public Health
Registry of Vital Records and Statistics
150 Mt. Vernon St. 1st Floor
Dorchester, MA 02125
617-740-2670

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Note to Readers

1. **Gestational Age:**
   This year we have added a new table, Table 10b, "Preterm and Term Births by Gestational Age Category, Massachusetts: 1999-2010." Also, the percent preterm calculation in Table 14 was changed to use the same methodology as was used in calculating the HP2020 target. (Refer to the "Gestational Age" entry in the Glossary for further explanation.)

   These changes have been made to support a new initiative to reduce preterm births. The Association of State and Territorial Health Officials (ASTHO) and the March of Dimes partnered to help states prevent preterm birth and infant mortality. The partnership was created to support ASTHO's Healthy Babies President's Challenge, the March of Dimes' Prematurity Campaign, and other public health initiatives with similar goals. Massachusetts has accepted the challenge and signed a pledge to perform the following:

   - Publicly announcing MDPH's goal to reduce the rate of premature birth by 8% by 2014 (measured against 2009 data).
   - Initiating and supporting programs and policies that reduce the premature birth rate.
   - Building wider awareness of Massachusetts prematurity rates and other related maternal and child indicators.

2. **Infant Mortality:** The infant mortality statistics in this report are based upon the 2010 Massachusetts death file (as of June 27, 2012) by the Massachusetts Registry of Vital Records. Infant mortality statistics released in the future may differ from those in this report because they may be updated to reflect additional information.

3. **Population:** Since the year 2010 is a decennial census collection year, we have used two population files based upon the 2010 Census for denominators in rate calculations:

   - The Massachusetts Department of Public Health Race Allocated Census 2010 Estimates file (MRACE 2010), which contains population estimates based upon the Census 2010 Summary File 1, was used to calculate city, town, and other substate rates. In this file, the Census 2010 race categories, "Two or more races" and "Some other race" are redistributed to the MDPH standard race categories: Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Asian and Pacific Islander, and Non-Hispanic American Indian and Alaska Native. All persons in the Census 2010 Hispanic ethnicity category are counted as "Hispanic" race in the MDPH estimates. This kind of file is often referred to as a "bridged" file, that is, one that bridges the new race and ethnicity collections to the conventionally used categories. These population estimates are available from MassCHIP (http://masschip.state.ma.us).

   - The 2010 Modified Age, Race/Ethnicity, and Sex file (MARS), which is another bridged population file produced by the National Center for Health Statistics (NCHS) and the Census Bureau Population Estimates Program to calculate state rates by race and Hispanic ethnicity, e.g., teen birth rates. This file has data by single years of age, sex, race and Hispanic ethnicity in the five mutually exclusive categories used by the Department: White Non-Hispanic, Black Non-Hispanic, Asian Non-Hispanic, American Indian/Alaska Native Non-Hispanic, and Hispanic.

4. **Rate, Proportion, and Number comparisons**: The comparison of rates, proportions, and numbers is based on tests of statistical significance. Comparative words, for example, "higher", "lower", "increase", and "decrease" are used only when the statistics being compared are statistically different (i.e., statistically significant at the $P \leq .05$ level). Please see the Technical Notes for a discussion of how statistical significance is determined. All statistics presented, unless stated otherwise, are based upon the number of births and not on the number of mothers. Proportions are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

5. **Resident births:** All data in this publication are resident data unless otherwise stated. Resident data include all events that occur to residents of the Commonwealth, wherever they occur (see Methods in Page 12).

6. **Race and Ethnicity:** In the text, the race categories, White, Black, American Indian, Asian, and Hispanic are mutually exclusive. For example, when we refer to White mothers, this means White non-Hispanic mothers, with the exception of Table 21 (see notes for Table 21).

7. **Teen Birth Rates:** When comparisons were made between 2010 teen birth rates and 2009 teen birth rates, 2009 birth rates were recalculated using the 2010 population counts, which are more up-to-date than the population estimates used in 2000.

Highlights

- In 2010, the total number of births to Massachusetts resident women was 72,835, which was 2,131 fewer births than there were in 2009. This was not a statistically significant decline in the number of births; however, there was a significant decline in the fertility rate for 2010 (53.7 births among women ages 15-44 per 1,000 births) from the 2009 rate (55.1). There were significant declines in birth rates among women ages 15-19 (see below), 20-24, 25-29, and among women ages 30-34 years.
- The 2010 teen birth rate in Massachusetts (17.1 births per 1,000 women ages 15-19) represented a decline from the 2009 rate (19.5 births per 1,000 women ages 15-19). This was the lowest teen birth rate ever recorded. The teen birth rates for Whites declined by 14.0% from that of 2009 (12.1 births per 1,000 women ages 15-19 in 2009 to 10.4 births per 1,000 women ages 15-19 in 2010)[1].
- In 2010, the percentage of mothers that reported smoking during pregnancy decreased by 7.0% from 6.8% in 2009 to 6.3% in 2010, which was the lowest percentage of smoking during pregnancy ever in Massachusetts.
- In 2010, the percentage of mothers receiving adequate prenatal care (PNC) increased to 84.9%, which was a 0.7% increase from the 2009 figure of 84.3%.
- In 2010, the percentage of mothers who breastfed or intended to breastfeed at time of discharge reached a record high of 83%, a 1% increase from 2009 which was driven by a 2% increase among White mothers.
- The 2010 Massachusetts Infant Mortality Rate (IMR) did not change significantly from 2009 (4.4 infant deaths per 1,000 live births in 2010 vs. 4.9 in 2009). The IMRs for all the race groups remained stable from 2009 as well. The 2010 Black IMR (8.2 infant deaths per 1,000 live births) was higher than the state IMR (4.4), while the White IMR (3.4 infant deaths per 1,000 live births) was lower than the state IMR.
- The primary cesarean delivery rate[2] remained stable from 2009. The rate in 2010 was 23.2% compared with 23.6% in 2009.
- The percentage of mothers who had their prenatal care paid through public programs (including Medicaid/MassHealth, Medicare, free care, other public programs) was 35.8% in 2010, similar to the 2009 figure of 36.1%.
- Disparities in birth outcomes by race and ethnicity, education, source of prenatal care payments, and by community persist.
    - The Black IMR was 2.5 times higher than the White IMR (8.2 vs. 3.4 infant deaths per 1,000 live births).
    - The birth rate for Hispanic teens was 4.7 times that of Whites (49.3 vs. 10.4 births per 1,000 women ages 15-19 years).
    - Compared with mothers who had a college degree or more, mothers with a high school education or less were less likely to receive adequate prenatal care, more likely to report smoking during their pregnancies, more likely to have publicly financed prenatal care, and more likely to deliver low birth weight (LBW) infants (less than 2,500 grams or 5.5 pounds).

[1] Teen birth rates for 2009 were calculated using the 2010 population. They will differ from previously published rates.
[2] The primary cesarean rate is calculated as the number of primary cesarean births divided by the total number of births to mothers with no prior cesareans, multiplied by 100.

- Mothers with their prenatal care paid through Medicaid/MassHealth were almost 6 times more likely to report smoking during pregnancy than those with their prenatal care paid through private sources (14.4% vs. 2.4%).
- In 2010, among the 30 largest communities in the state, Fall River (7.5%), and Lowell (6.7%) had the highest proportion of mothers with gestational diabetes mellitus (GDM), while Attleboro (1.7%), Barnstable (2.0%), and Arlington (2.9%) had the lowest.

Introduction

This report presents detailed data on the number and characteristics of Massachusetts births in 2010 including maternal behaviors and health characteristics, medical services utilization by pregnant mothers, and infant health characteristics. These statistics are based on data obtained from the Massachusetts Standard Certificate of Live Birth and the accompanying confidential health and demographic data for each birth record.

Birth certificate data are essential for surveillance, research, programs such as the Universal Newborn Hearing Screening and the Birth Defects Monitoring program, and high-risk infant identification. In addition, birth certificate data are used for the Maternal and Child Health (MCH) five-year needs assessment and evaluation process to prioritize interventions and services to improve birth outcomes and health, and for public health research datasets such as the Pregnancy to Early Life Longitudinal (PELL) database and the Pregnancy Risk Assessment Monitoring System (PRAMS). The Registry of Vital Records and Statistics and the Massachusetts birthing facilities play a critical role in the collection of birth information for civil registration purposes and provide data to programs for decision-making, which guides many public health initiatives.

Methods

Data on births are based on information from the Massachusetts Standard Certificate of Live Birth (1989 revision) filed with the Registry of Vital Records and Statistics. Medical data, such as birth weight and gestational age, is based on information supplied by hospitals and birthing facilities. Demographic and behavioral data, such as race and ethnicity and smoking during pregnancy, are supplied by the women who gave birth. For example, women chose their race from five categories: White, Black, Asian/Pacific Islander, American Indian, and Other. Mothers identified their ancestry by selecting one of the 38 ancestry/ethnicity groups[3].

Vital statistics birth data may be presented in terms of either maternal residence or place of birth. Resident data include all events that occur to residents of the Commonwealth, regardless of where they happen. In Massachusetts, a resident is a person with a permanent address in one of the 351 cities or towns. Occurrence data include all events that occur within the state, whether to residents or nonresidents. All data in this publication are for Massachusetts residents unless otherwise stated. There is an agreement among the 50 states, District of Columbia, Puerto Rico, Virgin Islands, Guam, and Canadian provinces that allows for the exchange of statistical copies of birth and death records for events occurring in a state other than the state of residence.

[3] See the “Technical Notes” for a list of ancestries listed in check boxes.

Results

Number and Birth Rate

In 2010, there were 72,835 births to Massachusetts resident mothers, a decline of 3% from 74,966 in 2009 and a decline of 21% since 1990. The birth rate among women of reproductive age (defined as the number of births per 1,000 females ages 15-44 years) declined by 14% between 1990 and 2010 and by 3% from 2009 (Table 1).

The mean or average maternal age at first birth in 2010 was 27.9 years, which was an increase of less than 1% from 2009 (27.7 years). Asian mothers had the highest mean age at first birth (29.8 years) and Hispanic mothers had the lowest mean age (23.5 years). There were no significant changes from 2009 for any race and Hispanic categories.

Births to women ages 25-34 years accounted for 57% of all births in 2010 (Table 4). Birth rates declined for women in all age groups 15 through 29 years between 2009 and 2010. Rates were unchanged among women 30 years and older.

Births by Race, Hispanic Ethnicity, and Mother's Birthplace

In 2010, the percentage of births to White mothers was 66.5% similar to the percentage in 2009 of 66.5%. There has been an overall decrease of 15% in the percentage of births to White mothers since 1990, when it was 78.4%. In 2010, the percentage of births to Asian, Hispanic, and Black mothers also remained stable compared to the 2009 figures. However, these percentages have increased since 1990 by 122%, 59%, and 21%, respectively (Table 1).

The percentage of births to non-US-born mothers remained the same in 2009 and 2010 (27.4%). However, this proportion decreased by 5% among White mothers in this period (Table 2, 2009 data not shown).

Births by Age Group

There has been a marked change in the age distribution of Massachusetts women giving birth since 1980. Approximately 25% of women giving birth in 1980 were 30 years and older compared with 54% in 2010 (Figure 1). The proportion of mothers who were 30 years and older increased by 2% from 2009, driven by a 7% increase among Black mothers (46% in 2010 vs. 43% in 2009). The proportion of mothers who were 30 years and older had been increasing at a rate of 4% per year between 1980 and 1995, then it slowed down to 2% per year between 1995 and 2002, and has been decreasing by 0.8% per year since 2003.

Marital Status

In 2010, the percentage of mothers who were not married at the time of delivery was 34.6% compared with 34.7% in 2009 (Table 1). In 2010, Hispanics continued to have the highest percentage of unmarried mothers at 67.5%, followed by Black mothers at 57.6%.
Among the largest ethnicity maternal groups, the percentage of mothers who were not married when delivering their infants ranged from 0.8% for Asian Indian mothers to 80% among Puerto Rican mothers. Puerto Rican, African-American, Honduran, Cape Verdean, Dominican, Salvadoran, and Cambodian mothers had the highest proportion of mothers who were not married at the time of delivery in 2010. Each of these proportions was significantly higher than the state overall rate.

In 2010, among the 30 largest communities in the state, Springfield (71.4%), Lawrence (70.2%), and New Bedford (64.0%), and Fall River (63.6%) had the largest proportion of births to mothers

who were not married at time of delivery, while Brookline (6.1%), Arlington (7.3%), and Newton (8.5%) had the lowest.

Breastfeeding
In 2010, the percentage of mothers who breastfed or intended to breastfeed at time of discharge reached a record high of 82.9% (Table 2), a 1% increase from 2009 which was driven by a 2% increase among White mothers. This proportion was highest among Asian mothers (90.4%) and lowest among White mothers (81.4%). Among the largest ethnicity maternal groups, the percentage of mothers who breastfed or intended to breastfeed ranged from 62.8% for Portuguese mothers to 97.8% among Asian Indian mothers.

Portuguese (62.8%), Cambodian (70.2%), Puerto Rican (72.0%), Native American (73.2%), African-American (75.9%), and American (77.4%) mothers had the lowest proportion of mothers who breastfed or intended to breastfeed in 2010. Among the ethnicity groups, the percentage of breastfeeding increased from 2009 for American (by 1.9%) and European (by 2.1%) mothers (Table 3, 2009 data not shown).

There is great variation in the percentage of mothers who breastfed or intended to breastfeed by education. In 2010, as in previous years, this proportion was highest among mothers with post-graduate and college educational attainment (93.9% and 90.3% respectively) and it was the lowest among mothers with less than a high school education (70.9%) (Table 17).

Multiple Births
In 2010, 95.4% of births were singletons (69,508 births), 4.4% were twins (3,220 births), and 0.1% were triplets or higher order multiples (107 births) (Table 5). White mothers continue to have the highest proportion of multiple births at 5.1%, while Hispanic mothers continue to have the lowest at 2.8%.

The total percentage of multiple births (twins, triplets or more) has been stable since 2002, after having a 5% increase per year between 1989 and 2002. In 2010, the total proportion of multiple births was 4.6%, compared with 4.7% in the previous year. The proportion of multiple births among mothers ages 35 years and older remained stable from 2009, at 7.6%. This proportion was twice that of mothers less than 35 years of age in 2010 (Table 5).

When we examine multiple births by education, we see that in 2010, as in previous years, this proportion was highest among mothers with post-graduate and college educational attainment (6.2% and 5.9% respectively) (Table 17).

Teen Births
In 2010, there were 3,907 births among women ages 15-19 years for a rate of 17.1 births per 1,000 females ages 15-19 years, which was the lowest ever recorded (Table 1). The Massachusetts teen birth rate in 2010 was 50% below the 2010 US teen birth rate of 34.3 births per 1,000 female ages 15-19 years[4].

5.4% of all births in 2010 were to women under 20 years of age. 29% of teen births were to teenagers 15-17 years (1,136 births), while 71% were to teenagers 18 and 19 years old (2,771) (Table 6). The number of births to the youngest mothers (ages 10-14 years) was 39 in 2010, 51 in 2009, 40 in 2008, and 49 in 2007. These are small numbers and fluctuate from year to year. Between 2010 and 2009, there was not a significant increase in the birth rate for this age group.

[4] Hamilton BE, Martin JA, Ventura SJ. Births: Preliminary data for 2010. National vital statistics reports web release; vol 60 no 2. Hyattsville, MD: National Center for Health Statistics. November 17, 2011.

In 2010, the youngest mother in Massachusetts was 12 years old, which was the same as in 2009.

The teen birth rates for Whites declined by 14.0% from that of 2009 (12.1 births per 1,000 women ages 15-19 in 2009 to 10.4 births per 1,000 women ages 15-19 in 2010)[5]. There were no significant changes among the other race and Hispanic ethnicity groups.

Among Massachusetts municipalities with the highest number of teen births, teen birth rates were higher in Holyoke (83.6), Lawrence (56.9), Springfield (54.3), Chelsea (51.8), Southbridge (49.0), New Bedford (47.4), Lynn (46.2), Lowell (44.7), and Fall River (44.6) than the state overall (Table 7). Please note that 2009 teen birth rates in this publication differ with those shown in *Massachusetts Births 2009* due to population updates in this year's report. In 2010, there were no statistically significant changes in teen birth rates among the cities and towns with the highest number of teen births from 2009.

Low Birth Weight

The percentage of low birth weight (LBW) infants (less than 2,500 grams or 5.5 pounds) was 7.8% in 2010, the same as in 2009. This proportion increased by 34% since 1990 when it was 5.8% (Table 1). Since 2004, the proportion of LBW infants in Massachusetts has remained stable. Black infants continue to have the highest percentage of LBW at 10.9%, while White infants have the lowest at 7.0%. Infants whose mothers were African American (13.3%), Asian Indian (10.6%), Haitian (10.2%), Puerto Rican (9.5%), and Other Asian (9.0%), ancestries had significantly higher LBW rates than the state overall LBW rate of 7.8% (Table 3).

The percentage of low birth weight among twin births is about 10 times larger than that among singletons. In 2010, 5.6% of singleton births were LBW; whereas, 51.8% of twins and 96.2% of higher order births were LBW (Table 9).

The percentage of very low birth weight (VLBW) infants (less than 1,500 grams or 3.3 pounds), was 1.3% in 2010, similar to that in 2009 at 1.4%. The proportion of VLBW infants born to women ages 35 and older was 1.5%, compared with 1.3% among women less than 35 years of age (Table 9). Black infants continue to have the highest percentage of VLBW at 2.3%, while White infants had the lowest at 1.1% (Table 8).

Preterm and Term Deliveries

The percentage of preterm infants (infants delivered before the 37th week of gestation) was 8.6% in 2010 compared with 8.7% in 2009, (Table 1). Black mothers continued to have the highest percentage of preterm infants at 10.6% (Table 10a). There were no significant changes from the 2009 proportion of preterm infants by race and ethnicity. Among maternal ancestry groups, African American (11.8%), Haitian (11.2%), and Puerto Rican (10.8%) mothers had higher preterm rates than the state overall rate (8.6%).

The percentage of infants delivered very early (before the 28th week of gestation) was 0.6% in 2010. This proportion has remained stable since 1997 when it was 0.6% (close to 500 births each year). Black women had the highest percentage (1.2%) of infants delivered very early while White mothers had the lowest proportion of infants delivered very early (0.5%) (Table 10a).

[5] Teen birth rates for 2009 were calculated using the 2010 population. They will differ from previously published rates.

Table 10b shows the percent preterm and term births in Massachusetts from 1999 to 2010. The preterm births are shown by three categories, one for each level of preterm: very early preterm (<28 weeks), moderate preterm (28-33 weeks), and late preterm (34-36 weeks), and the term births are shown in two categories, early term (37-38 weeks) and full term (37+ weeks). Note that the full term and early term are not mutually exclusive. Over the past decade, most preterm infants are born between 34 and 36 weeks, the late preterm period, and they make up about two-thirds of preterm births. The very early and moderate preterm births combined make up around one-third of the preterm births.

In 2010, late preterm infants (infants delivered between 34-36 weeks of gestation) comprised 70% of all preterm births in the state. Infants born 34-36 weeks are at heightened risk for adverse health outcomes when compared with infants delivered at higher gestational ages[6]. In 2010, the percentage of late preterm births was 6.0% (Table 1), same as in 2009.

There is growing evidence of increased neonatal morbidity and mortality among early term infants (infants born between 37-38 weeks of gestation), compared with those born between 39-41 weeks of gestation)[7,8,9] – the latter also known as *full* term infants. The proportion of infants born at *early* term had been increasing at a rate of 4.9% per year from 1997 to 2005. Since 2005, this proportion is declining at a rate of 1.7% per year.

The proportion of infants born at *early* term was higher than the state's figure for Hispanic (24.4%) and Asian (23.1%) infants and was lower than the state's figure for White infants (20.2%) (Table 10a). In 2010, this percentage increased 9% for Hispanics from 2009 (24.4% vs. 21.2%).

Smoking

In 2010, 4,579 mothers reported smoking during pregnancy, which was the lowest annual number of mothers smoking during pregnancy in Massachusetts and accounted for 6.3% of all births that year (Figure 3). White mothers continued to have the highest reported percentage of smoking during pregnancy at 7.5%; however, they were the only racial group to show a decline from the previous year (8.1% in 2009).

Among the largest maternal ancestry groups, the percentage of mothers smoking during pregnancy ranged from a low of 0.94% for Haitian mothers to a high of 20.6% among Native American mothers. Native American (20.6%), American (9.7%), African American (9.5%), Puerto Rican (9.3%), and Portuguese (9.1%) mothers had the highest proportion of mothers who reported smoking during pregnancy in 2010. Each of these proportions was significantly higher than the state overall rate.

While mothers who had prenatal care paid for by Medicaid/MassHealth accounted for only 27% of all births, they encompass 61% of mothers who reported smoking during pregnancy in 2010 (Table 30). This group had 6 times the smoking rate of mothers with prenatal care paid through private insurance (14.4% vs. 2.4% respectively). White mothers who had prenatal care paid for

[6] Shapiro-Mendoza CK. Pediatrics 2008; 121:e223-232; Escobar GJ Arch Dis Child 2005; 90:125; Escobar G. Semin Perinatol 2006; 30:28-33; Morse SB Pediatr Res 2006A in Adams-Chapman I Clin Perinatol 2006;33:947; Tomashak KM. J Pediatr 2007; 151:450; Linnet KM. Arch Dis Child 2006; 91:655.

[7] Reddy U et al. Term Pregnancy: A Period of Heterogeneous Risk for Infant Mortality. Obstetrics & Gynecology Volume 117- Issue 6 - pp 1279-1287. doi:10.1097/AOG.0b013e3182179e28. June 2011.

[8] Zhang Xu, Kramer MS. Variation in mortality and morbidity by gestational age among infants born at term. J Pediatr. Mar;154(3):358-62. 2009.

[9] Engle WA, Kominiarek MA. Late preterm infants, early term infants and the timing of elective deliveries. Clin Perinatol 35(2):32541. 2008.

by Medicaid/MassHealth continued to have the highest percentage of smoking during pregnancy at 23.2%.

In 2010, among the 30 largest cities and towns in the state, Pittsfield (23.9%), Fall River (17.1%), and New Bedford (14.9%) had higher reported smoking during pregnancy than the state overall, while Brookline (0.6%), Newton (1.0%), and Arlington (1.1%) had lower rates than the state (data not shown). The latter three cities are the only cities among the 30 largest cities that reached the HP2020 target of 1.4% (or less) of women reporting smoking during pregnancy (Table 14).Examining smoking during pregnancy by mother's education, we see that mothers with less than a high school education had the highest proportion of smoking during pregnancy (17.1%) which was 57 times higher that the percentage reported by mothers with a post-graduate education (0.3%) (Table 17). In 2010, mothers who reported smoking during pregnancy were 1.6 times more likely to have a low birth weight infant than those who reported non-smoking during pregnancy (11.8% vs. 7.5%) (Figure 21).

Prenatal Care

In 2010, the percentage of mothers receiving adequate prenatal care (PNC) increased to 84.9%, which was a 0.7% increase from the 2009 figure of 84.3% (Table 1). Adequacy of prenatal care utilization (APNCU) is a measure of the timing and number of prenatal care visits, not an assessment of the quality of PNC. APNCU had been declining between 2001 and 2008 at 0.5% per year and has increased by 1.6% per year ever since.

In 2010, Black and Hispanic mothers continued to have the lowest proportion of women receiving adequate PNC (76.8% and 79.0%, respectively), while White mothers continued to have the highest percentage (87.3%)(Figure 5).

Among the largest maternal ethnicity groups, European (88.9%), Chinese (87.2%), Brazilian (86.7%), and American (86.7%) mothers had significantly higher rates of APNCU than the state overall rate of 84.9%. Haitian (71.9%), African (75.8%), Puerto Rican (76.4), Cape Verdean (76.4%), Guatemalan (77.5%), Honduran (78.0%), Mexican (79.3%), and African-American (79.6%), mothers had significantly lower percentages of APNCU in 2010 (Table 3).

Mothers with the following maternal characteristics had a lower proportion of adequate prenatal care than the state overall: less than 18 years old, less than a high school education, smoking during pregnancy, unmarried, and non-US-born (Figure 6). In contrast, mothers with the following maternal characteristics had a higher percentage of adequate prenatal care than the state overall: ages 35 and older, mothers with more than a college education and mothers of multiples.

In 2010, among the 30 largest communities in the state, Weymouth (92.9%), Framingham (91.5%), and Arlington (91.1%) had higher proportion of mothers with adequate prenatal care than the state overall, while Pittsfield (70.5%), Springfield (71.8%), Worcester (72.0%), Lawrence (72.2%), Brockton (76.2%), New Bedford (76.4%), and Taunton (78.1%) had lower rates than the state (Table 12).

Publicly Financed and Privately Insured Prenatal Care

Maternal characteristics and birth outcomes varied according to whether PNC was paid through public[10] programs or through private[11] insurance. The percentage of mothers who had their

[10] Public programs include: Medicaid/MassHealth, CommonHealth, Healthy Start, and Medicare (may also be HMO or managed care), or free care.

[11] Private insurance include: Commercial indemnity plan, commercial managed care (HMO, PPO, IPP, IPA, and other), or other private insurance.

prenatal care paid through public programs was 35.8% in 2010, similar to the 2009 figure of 36.1% (Figure 7).

Hispanic mothers continued to have the highest rate of PNC paid through public funds at 73.7%, followed by Black mothers at 59.7% (Table 30). There were no significant changes from the 2009 proportion of mothers with their PNC paid through public sources by race and ethnicity. In 2010, among the 30 largest communities in the state, Lawrence (77.1%), Springfield (75.6%), Fall River (70.4%), Lynn (67.0%), Brockton (63.1%), Lowell (58.4%), and New Bedford (55.4%) had the highest proportion of mothers whose PNC was paid through public funds, while Brookline (6.7%), Arlington (7.3%), and Newton (8.3%) had the lowest (Table 12).

Overall, in Massachusetts, 27.2% of mothers had prenatal care paid through Medicaid/ MassHealth, accounting for 76% of all PNC payments through public programs (Table 30). However, Medicaid/MassHealth payment for PNC varied widely by race and Hispanic ethnicity. Half of Hispanic mothers and 47.1% of Black mothers had their PNC paid through Medicaid/MassHealth; whereas, 21.3% of Asian and 19.7% of White mothers' PNC was paid through Medicaid/MassHealth.

Cesarean Delivery

The overall cesarean delivery rate in 2010 was 33.3% compared with 33.6% in 2009 (Table 1). Between 1997 and 2004, the overall cesarean delivery rate increased at 7.0% per year. Then the rate of increase slowed to 2% per year until 2008. The rate has been stable (no significant changes) since 2008.

Historically, cesarean delivery rates increase with the age of mother. In 2010, almost one out of two women aged 40 and older (46.5%) delivered by cesarean compared with less than one in five women under age 20 (18.1%) (data not shown).

As in previous years, rates of cesarean delivery varied by race and Hispanic ethnicity in 2010. Hispanic and Asian mothers continued to have the lowest cesarean delivery rates (28.7% and 30.2%, respectively), while Black and White mothers continued to have the highest rates (35.1% and 34.5%, respectively). There were no significant changes from 2009 for any race and ethnicity.

Among the largest ethnicity groups, Brazilian mothers had the highest percentage of cesarean deliveries (42.9%), followed by Haitian (41.0%), Asian Indian (38.3%), Portuguese (37.8%), and African (37.5%) mothers. Cambodian (19.9%), Salvadoran (20.6%), Guatemalan (23.1%), Vietnamese (25.8%), and Mexican (26.1%) mothers had the lowest percentage of cesarean deliveries in 2010 (Table 3).

In 2010, sixteen hospitals had higher percentages of cesarean births than the State had (33.4). These were: Melrose-Wakefield Hospital (43.1), South Shore Hospital (42.9), Caritas Holy Family Hospital And Medical Center (42), Brockton Hospital (41.8), Caritas Good Samaritan Medical Center (40.1), Fairview Hospital (40.1), Metrowest Medical Center-Framingham Union Campus (39.9), Tufts Medical Center (38.9), Beth Israel Deaconess Medical Center (38.0), Sturdy Memorial Hospital (37.7), Falmouth Hospital (37.2), Winchester Hospital (37.2), Caritas Norwood Hospital (37.0), St. Luke's Hospital (36.7), Caritas St. Elizabeth's Medical Center of Boston (36.0), and Charlton Memorial Hospital (35.8).

Eighteen hospitals had lower percentages of cesarean births than the State had. These were: Baystate Franklin Medical Center (20.9), Heywood Memorial Hospital (21.3), Holyoke Hospital (22.1), Tobey Hospital (24.7), Mount Auburn Hospital (25.6), North Adams Regional Hospital

(25.6), Cambridge Hospital (26.1), Mercy Medical Center (26.7), Leominster Hospital (27.0), Nantucket Cottage Hospital (27.0), Saint Vincent Hospital (28.9), Anna Jaques Hospital (29.1), Massachusetts General Hospital (29.2), Cooley Dickinson Hospital (29.4), UMass Memorial Medical Center - West Campus (29.4), Boston Medical Center (30.1), Cape Cod Hospital (30.4), and Beverly Hospital (30.5).

From 2009 to 2010, five hospitals experienced an increase in the percentage of cesarean births including, Fairview Hospital (40.1), Heywood Memorial Hospital (21.3), Holyoke Hospital (22.1), Mount Auburn Hospital (25.6), and Saint Vincent Hospital (28.9), but, of these, only Fairview had a higher rate than that of the State. On the other hand, five hospitals had a decrease in the cesarean birth rate including, Anna Jaques Hospital (29.1), Beverly Hospital (30.5), Emerson Hospital (31.4), Massachusetts General Hospital (29.2), and Newton Wellesley Hospital (34.2). Of the hospitals whose rates declined, Anna Jaques Hospital, Beverly Hospital, and Massachusetts General Hospital had rates below that of the State.

Gestational Diabetes Mellitus (GDM)
In 2010, the prevalence of GDM was 4.7% the same as in 2009 (Table 1). Asians continued to have the highest prevalence of GDM (8.5%), while White mothers had the lowest (4.1%).

Among the largest maternal ethnicity groups, Asian Indian (10.5%), Chinese (9.1%), Other Asian (9.0%), and Vietnamese (8.2%), mothers had a higher prevalence of GDM than the overall state prevalence. Cape Verdean (3.3%), European (3.5%) and American (4.2%) mothers had a significantly lower prevalence of GDM than the state's figure (Table 3).

Infant Mortality Rate (IMR)
In 2010, there were 319 infant deaths (deaths of infants less than one year of age) compared with 366 in 2009 (Table 11). The IMR was 4.4 deaths per 1,000 live births in 2010, compared with 4.9 deaths per 1,000 live births in 2009. This change was not statistically significant. While the IMR has decreased by 37% since 1990, from 7.0 to 4.4 deaths per 1,000 live births, it has remained stable in the last decade.

The majority of infant deaths occur in the neonatal period (before 28 days of life). The remaining infant deaths occur in the post neonatal period (between 28 and 364 days of life). In 2010, three out of four (75%) infant deaths occurred in the neonatal period and 25% in the post neonatal period (Figure 18).

The IMR among mothers of all race groups remained stable from the 2009 rates. (Table 11). The Black IMR for 2010 (8.2 deaths per 1,000 live births) was higher than the state IMR (4.4 deaths per 1,000 live births), and the White IMR (3.4 deaths per 1,000 live births) was lower than the state IMR.

Birth Characteristics in the 30 Largest Massachusetts Cities and Towns
In 2010, in the 30 largest municipalities in the Commonwealth, maternal characteristics and outcomes varied (Table 12):

- The proportion of mothers receiving adequate prenatal care ranged from a low of 70.5% in Pittsfield to a high of 92.9% in Weymouth.
- The proportion of mothers with prenatal care paid through public sources (government programs including Medicaid/MassHealth, Healthy Start, Medicare, CommonHealth, free care and other) ranged from 6.7% in Brookline to 77.1% in Lawrence.
- The proportion of mothers that were unmarried at time of delivery ranged from 6.1% in Brookline to 71.4% in Springfield.

- The gestational diabetes mellitus (GDM) prevalence was significantly higher than the statewide prevalence of 4.7% for Fall River (7.5%) and Lowell (6.7%).
- Three communities recorded low birth weight percentages that were higher than the statewide average of 7.8%: Framingham (10.6%), Springfield (9.8%), and Boston (9.4%).
- Twelve of the 30 largest communities had higher rates of reported smoking during pregnancy than the state rate of 6.3%. In Pittsfield (23.9%) the rate was over three times higher than the state rate. In Fall River (17.1%), New Bedford (14.9%), Taunton (13.0%), Springfield (12.8%), and Barnstable (12.7%) these rates were between two and three times the state rate.
- In eighteen of the thirty largest communities the teen birth rates per 1,000 women ages 15-19 were significantly higher than the statewide rate of 17.1. The highest rates were in Holyoke (83.6), Lawrence (56.9), and Springfield (54.3).

A Comparison of Massachusetts and US Indicators

According to the US birth statistics for 2010[12], the following Massachusetts perinatal health indicators in 2010 were significantly different than those for the US:

- The fertility rate (births to women ages 15-44 years per 1,000 women ages 15-44 years) in Massachusetts was 53.7, 16% below the US fertility rate of 64.1.
- The teen birth rate in Massachusetts (17.1 births per 1,000 females ages 15-19 years) was half that of the US rate (34.3 births per 1,000 females ages 15-19 years).
- The percentage of unmarried mothers in Massachusetts (34.6%) was 15% lower than the US percentage of unmarried mothers (40.8%).
- The IMR in Massachusetts (4.4 deaths per 1,000 live births) was 28% lower than the US IMR in 2010 (6.1 deaths per 1,000 live births)[13].

[12] Hamilton BE, Martin JA, Ventura SJ. Births: Preliminary data for 2010. National vital statistics reports web release; vol 60 no 2. Hyattsville, MD: National Center for Health Statistics. November 17, 2011.

[13] Calculated from 2 reports:

- Murphy SL, Xu JQ, Kochanek KD. Deaths: Preliminary Data for 2010. National Vital Statistics Reports; vol 60 no 4. Hyattsville, MD: National Center for Health Statistics. January 11, 2012.
- Joyce A. Martin, M.P.H.; Brady E. Hamilton, Ph.D.; Ph.D.; Stephanie J. Ventura, M.A Michelle J.K. Osterman, M.H.S.; Elizabeth C. Wilson M.P.H.; and T.J. Mathews, M.S. National Vital Statistics Reports; vol 61 no 1. Hyattsville, MD: National Center for Health Statistics. August, 2012.

Healthy People 2020 Objectives

In December of 2010, the US Department of Health and Human Services set new targets for the year 2020 for each measurable Healthy People objective 2020 (HP2020)[14]. Table 14 presents the most recent Massachusetts data and measures the Commonwealth's progress toward meeting the targets set for sixteen of the HP2020 Maternal, Infant, and Child Health (MICH) objectives. The revised targets for the year 2020 have been set to include more current national baseline measures using data sources from the National Vital Statistics System (NVSS), CDC, and NCHS. For thirteen of sixteen HP2020 objectives presented, Massachusetts has met the 2020 targets (Table 14). For three objectives, the 2010 Massachusetts indicators are within 25% of the 2020 target goals: cesareans among low-risk women giving birth for the first time (this group is also known as NTSV births: nulliparous, term, singleton, vertex births), cesareans among low-risk women who had a prior cesarean, and smoking during pregnancy.

[14] U.S. Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=26

Table 1. Trends in Birth Characteristics, Massachusetts: 1990, 1996-2010

Characteristic		1990	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Births[1]	n[2]	92,461	80,164	80,321	81,406	80,866	81,582	81,014	80,624	80,167	78,460	76,824	77,670	77,934	76,969	74,966	72,835
	Rate[3]	62.1	54.6	54.7	55.6	55.9	57.1	56.6	56.8	56.8	56.2	55.6	56.9	57.2	56.5	55.1	53.7
Race of Mother																	
White non-Hispanic	n	72,483	61,829	61,204	61,764	60,402	60,051	59,115	58,136	57,604	55,322	53,469	52,975	52,620	51,760	49,759	48,466
	%[4]	78.4	77.1	76.2	75.9	74.7	73.6	73.0	72.1	71.9	70.5	69.6	68.2	67.5	67.2	66.4	66.5
Black non-Hispanic	n	7,158	5,491	5,482	5,549	5,844	5,755	5,862	5,948	5,902	6,053	6,077	6,452	6,462	6,652	6,945	6,794
	%[4]	7.7	6.9	6.8	6.8	7.2	7.1	7.2	7.4	7.4	7.7	7.9	8.3	8.3	8.6	9.3	9.3
Asian	n	3,349	3,398	3,719	3,748	4,138	4,667	4,784	5,300	5,224	5,454	5,251	5,469	5,758	5,958	5,939	5,817
	%[4]	3.6	4.2	4.6	4.6	5.2	5.7	5.9	6.6	6.5	7.0	6.8	7.0	7.4	7.7	7.9	8.0
Hispanic	n	8,406	7,756	8,211	8,665	8,815	9,247	9,410	9,543	9,764	9,798	10,061	10,696	10,861	10,895	10,986	10,588
	%[4]	9.1	9.7	10.2	10.6	10.9	11.3	11.6	11.8	12.2	12.5	13.1	13.8	13.9	14.2	14.7	14.5
Teen Births	n	7,258	5,758	5,801	5,823	5,515	5,305	4,979	4,642	4,639	4,559	4,539	4,722	4,944	4,583	4,477	3,907
(Ages 15-19)	Rate[3]	35.4	28.5	28.5	28.1	26.7	25.9	24.9	23.3	23.0	22.2	21.7	21.3	22.0	20.1	19.5	17.1
Births to Unmarried	n	22,837	20,253	20,640	21,191	21,448	21,621	21,620	21,604	22,262	22,376	23,170	24,977	26,010	26,146	26,029	25,220
	%	24.7	25.3	25.7	26.0	26.5	26.5	26.7	26.8	27.8	28.5	30.2	32.2	33.4	34.0	34.7	34.6
Cesarean Deliveries	n	20,615	15,675	15,742	16,975	18,080	19,086	20,639	22,553	23,392	24,295	24,732	25,901	26,240	26,240	25,067	24,244
	%	22.3	19.6	19.6	20.9	22.4	23.4	25.5	28.0	29.2	31.0	32.3	33.4	33.7	34.3	33.6	33.3
Gestational Diabetes[5]	n						2,245	2,402	2,633	2,693	2,741	2,666	2,925	3,279	3,086	3,445	3,368
	%						2.8	3.0	3.3	3.4	3.5	3.5	3.8	4.2	4.0	4.7	4.7
Low Birthweight[6]	n	5,388	5,105	5,617	5,655	5,708	5,711	5,795	6,060	6,115	6,125	6,073	6,150	6,147	5,955	5,804	5,650
	%	5.8	6.4	7.0	7.0	7.1	7.1	7.2	7.5	7.6	7.8	7.9	7.9	7.9	7.8	7.8	7.8
Preterm[7]	n	5,899	5,705	5,831	6,117	6,136	6,582	6,412	6,795	6,963	7,222	6,925	6,954	6,980	6,750	6,516	6,234
	%	6.5	7.2	7.3	7.6	7.6	8.3	8.0	8.5	8.7	9.2	9.0	9.0	9.0	8.8	8.7	8.6
Late Preterm[8]	n	3,977	3,966	3,949	4,186	4,153	4,509	4,428	4,726	4,800	5,016	4,808	4,918	4,945	4,753	4,602	4,361
	%	4.4	5.0	4.9	5.2	5.2	5.7	5.5	5.9	6.0	6.4	6.3	6.3	6.4	6.2	6.2	6.0
Prenatal Care																	
Public Pay Prenatal Care[9]	%	25.1	24.4	24.2	24.5	26.1	26.5	27.2	27.9	28.3	29.9	31.9	33.5	34.9	34.5	35.3	35.8
APNCU Index[10]	%		83.3	82.9	82.9	82.9	83.3	85.2	84.7	84.5	84.2	84.0	83.1	82.8	82.1	84.3	84.9

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. Births presented in all tables are resident live births unless otherwise specified. 2. Differences in numbers of births from previous publications are the result of updated files. 3. Birth rates represent the total number of births to women ages 15-44 years per 1,000 females ages 15-44; teen birth rates refer to number of births per 1,000 females ages 15-19. 4. Percentages are calculated based on births, including those to mothers of unknown race. 5. Gestational diabetes is defined as glucose intolerance found during pregnancy for the first time. It excludes cases with pre-existing diabetes. 6. Low birthweight: less than 2,500 grams or 5.5 pounds. 7. Preterm: <37 weeks gestation. 8. Late preterm: 34-36 weeks of gestation. 9. Government programs including Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may also be HMO or managed care), or free care; other: Worker's Compensation and other sources. 10. Beginning with Births 2001, the APNCU Index has replaced the Kessner Index as the standard measurement of adequacy of prenatal care (see Technical Notes for more information).

Table 2. Birth Characteristics by Maternal Race/Hispanic Ethnicity and Birthplace, Massachusetts: 2010

Race and Hispanic Ethnicity (by mother's birthplace)	Births		Teen Births				Birthweight				Prenatal Care				Cesarean Deliveries		Breastfeeding[5]	
			<18 Years		<20 Years		Very Low[2]		Low[3]		Adequate[4]		1st Trimester					
	n	%[1]	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
State Total	**72,835**	**100.0**	**1,175**	**1.6**	**3,946**	**5.4**	**961**	**1.3**	**5,650**	**7.8**	**60,782**	**84.9**	**60,346**	**83.9**	**24,244**	**33.3**	**59,580**	**82.9**
US inc. DC	51,057	70.1	916	1.8	3,106	6.1	657	1.3	3,950	7.7	43,226	86.2	43,151	85.7	17,148	33.7	39,808	79.3
US Territories[7]	1,820	2.5	112	6.2	331	18.2	37	2.0	194	10.7	1,372	76.0	1,388	76.6	550	30.3	1,367	75.4
Non-US-born[8]	19,952	27.4	147	0.7	509	2.6	266	1.3	1,504	7.5	16,181	82.2	15,804	80.0	6,545	32.8	18,403	92.8
White Non-Hispanic	**48,466**	**66.5**	**396**	**0.8**	**1,690**	**3.5**	**530**	**1.1**	**3,411**	**7.0**	**41,540**	**87.3**	**41,577**	**87.0**	**16,688**	**34.5**	**38,822**	**81.4**
US inc. DC	42,639	88.0	378	0.9	1,615	3.8	474	1.1	3,045	7.1	36,662	87.6	36,701	87.3	14,721	34.6	33,424	79.8
US Territories[7]	86	0.2	6	7.0	14	16.3	3	--[6]	9	10.5	66	76.7	65	75.6	28	32.6	71	82.6
Non-US-born[8]	5,738	11.8	12	0.2	61	1.1	53	0.9	357	6.2	4,809	85.0	4,808	84.6	1,938	33.8	5,325	93.6
Black non-Hispanic	**6,794**	**9.3**	**165**	**2.4**	**525**	**7.7**	**159**	**2.3**	**740**	**10.9**	**5,137**	**76.8**	**5,031**	**75.0**	**2,382**	**35.1**	**5,763**	**85.3**
US inc. DC	3,158	46.5	138	4.4	442	14.0	89	2.8	424	13.4	2,451	79.1	2,434	78.3	983	31.2	2,389	76.1
US Territories[7]	14	0.2	0	0.0	2	--[6]	1	--[6]	4	--[6]	10	71.4	11	78.6	6	42.9	11	78.6
Non-US-born[8]	3,622	53.3	27	0.7	81	2.2	69	1.9	312	8.6	2,676	74.8	2,586	72.2	1,393	38.5	3,363	93.4
Hispanic	**10,588**	**14.5**	**552**	**5.2**	**1,537**	**14.5**	**166**	**1.6**	**893**	**8.4**	**8,274**	**79.0**	**8,043**	**76.6**	**3,033**	**28.7**	**8,778**	**83.3**
US inc. DC	3,866	36.5	345	8.9	892	23.1	66	1.7	347	9.0	2,983	77.9	2,927	76.3	1,096	28.4	2,877	75.0
US Territories[7]	1,713	16.2	105	6.1	312	18.2	32	1.9	180	10.5	1,293	76.0	1,309	76.6	514	30.0	1,281	75.0
Non-US-born[8]	5,009	47.3	102	2.0	333	6.6	68	1.4	366	7.3	3,998	80.9	3,807	76.8	1,423	28.4	4,620	92.5
Asian	**5,817**	**8.0**	**42**	**0.7**	**119**	**2.0**	**81**	**1.4**	**502**	**8.6**	**4,901**	**85.1**	**4,773**	**82.7**	**1,755**	**30.2**	**5,237**	**90.4**
US inc. DC	893	15.4	37	4.1	101	11.3	18	2.0	92	10.3	750	84.7	711	80.0	215	24.1	751	84.4
US Territories[7]	2	--[6]	0	0.0	0	0.0	0	0.0	0	0.0	1	--[6]	2	--[6]	1	--[6]	1	--[6]
Non-US-born[8]	4,921	84.6	5	0.1	18	0.4	62	1.3	409	8.3	4,150	85.2	4,060	83.2	1,539	31.3	4,485	91.5
American Indian[9]	**105**	**0.1**	**2**	**--[6]**	**10**	**9.5**	**1**	**--[6]**	**11**	**10.5**	**81**	**77.9**	**80**	**76.9**	**42**	**40.0**	**78**	**74.3**
US inc. DC	97	92.4	2	--[6]	10	10.3	1	--[6]	11	11.3	75	78.1	76	79.2	38	39.2	72	74.2
US Territories[7]	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Non-US-born[8]	8	7.6	0	0.0	0	0.0	0	0.0	0	0.0	6	75.0	4	--[6]	4	--[6]	6	75.0
Other[10]	**978**	**1.3**	**17**	**1.7**	**61**	**6.2**	**17**	**1.7**	**83**	**8.5**	**808**	**84.9**	**801**	**83.7**	**324**	**33.2**	**860**	**91.3**
US inc. DC	346	35.4	16	4.6	44	12.8	4	--[6]	25	7.2	281	83.4	279	82.5	85	24.6	271	82.1
US Territories[7]	3	--[6]	0	0.0	1	--[6]	1	--[6]	1	--[6]	2	--[6]	1	--[6]	1	--[6]	3	--[6]
Non-US-born[8]	628	64.2	1	--[6]	16	2.5	12	1.9	56	8.9	525	85.8	521	84.6	238	37.9	586	96.4
Unknown[11]	**87**	**0.1**	**1**	**--[6]**	**4**	**--[6]**	**7**	**11.9**	**10**	**16.9**	**42**	**77.8**	**42**	**72.4**	**21**	**35.6**	**43**	**87.8**

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. In the column "Births %," the percentages of the race/Hispanic groups (bolded) are based on the state total (including births of unknown race/ethnicity), and the birthplace percents for the race/ethnicities are based on the total number in race/Hispanic ethnicity category. For all other categories, percentages are based on row totals. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low birthweight: less than 2,500 grams or 5.5 pounds. 4 Based on Adequacy of Prenatal Care Utilization (APNCU) Index. 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 6. Calculations based on 1-4 events are excluded. 7. The category "US Territories" includes women born in Puerto Rico, the US Virgin Islands, and Guam. Approximately 95% of the births in this category were to women born in Puerto Rico. 8. The category "Non-US-born" includes women born outside of the 50 US states, District of Columbia, and the US territories. 9. Mothers who selected American Indian as their race. 10. Mothers who indicated "Other" as their race. 11. Mothers who did not indicate a race/ethnicity.

Table 3. Birth Characteristics by Maternal Ancestry, Massachusetts: 2010

Maternal Ancestry	Births[1]		Teen Births				Low Birthwt[2]		Prenatal Care				Late Preterm[4]		Cesarean Section		Breast-feeding[5]		Gestational Diabetes[6]	
			<18 years		<20 Years				Adequate[3]		1st Trimester									
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
State Total	**72,835**	**100.0**	**1,175**	**1.6**	**3,946**	**5.4**	**5,650**	**7.8**	**60,782**	**84.9**	**60,346**	**83.9**	**4,361**	**6.0**	**24,244**	**33.3**	**59,580**	**82.9**	**3,368**	**4.7**
American	28,443	39.1	304	1.1	1,349	4.7	2,160	7.6	24,380	86.7	24,576	87.2	1,729	6.1	9,718	34.2	22,011	77.4	1,174	4.2
European	14,498	19.9	52	0.4	198	1.4	879	6.1	12,607	88.9	12,538	87.9	797	5.5	4,963	34.2	12,750	88.2	508	3.5
Puerto Rican	4,533	6.2	360	7.9	985	21.7	432	9.5	3,440	76.4	3,429	76.0	342	7.5	1,318	29.1	3,245	72.0	213	4.7
African-American	2,570	3.5	110	4.3	341	13.3	343	13.3	2,006	79.6	1,988	78.6	194	7.6	784	30.6	1,945	75.9	120	4.7
Dominican	2,154	3.0	79	3.7	248	11.5	173	8.0	1,722	80.9	1,684	78.8	105	4.9	723	33.6	1,937	90.1	103	4.8
Brazilian	1,918	2.6	12	0.6	48	2.5	138	7.2	1,633	86.7	1,618	85.4	91	4.7	823	42.9	1,807	94.4	95	5.0
Asian Indian	1,618	2.2	0	0.0	2	--[7]	171	10.6	1,374	85.4	1,376	85.5	82	5.1	618	38.3	1,579	97.8	170	10.5
African	1,605	2.2	4	--[7]	20	1.2	118	7.4	1,203	75.8	1,155	72.6	81	5.0	601	37.5	1,529	95.4	94	5.9
Chinese	1,515	2.1	4	--[7]	5	0.3	86	5.7	1,309	87.2	1,322	87.8	71	4.7	415	27.4	1,388	92.2	137	9.1
Haitian	1,172	1.6	11	0.9	32	2.7	120	10.2	830	71.9	819	70.7	84	7.2	480	41.0	1,068	91.1	69	5.9
Salvadoran	1,087	1.5	48	4.4	104	9.6	81	7.5	902	84.4	824	76.7	65	6.0	224	20.6	1,021	94.1	66	6.1
Middle Eastern	976	1.3	5	0.5	16	1.6	57	5.8	785	81.1	771	79.5	44	4.5	307	31.5	907	93.1	61	6.3
Cape Verdean	958	1.3	29	3.0	97	10.1	70	7.3	726	76.4	702	73.9	49	5.1	304	31.7	830	87.1	32	3.3
Guatemalan	920	1.3	23	2.5	76	8.3	61	6.6	701	77.5	646	71.1	38	4.1	212	23.1	833	90.8	43	4.7
Portuguese	878	1.2	22	2.5	51	5.8	50	5.7	733	83.9	730	83.4	45	5.1	331	37.8	536	61.3	51	5.8
South American	872	1.2	11	1.3	41	4.7	66	7.6	703	81.4	692	80.0	51	5.9	271	31.1	808	93.6	37	4.3
Cambodian	652	0.9	24	3.7	76	11.7	67	10.3	526	81.6	454	70.4	42	6.4	130	19.9	456	70.2	32	4.9
Vietnamese	589	0.8	9	1.5	17	2.9	45	7.6	505	86.3	478	81.7	37	6.3	152	25.8	477	81.1	48	8.2
Mexican	482	0.7	12	2.5	41	8.5	31	6.4	375	79.3	361	76.2	19	3.9	126	26.1	436	90.8	25	5.2
Korean	431	0.6	0	0.0	1	--[7]	30	7.0	361	86.0	363	85.6	31	7.2	130	30.2	405	94.2	18	4.2
Other Asian/PI	379	0.5	0	0.0	2	--[7]	34	9.0	304	81.3	289	76.9	24	6.3	111	29.3	347	91.8	34	9.0
Native American[8]	223	0.3	5	2.2	22	9.9	14	6.3	179	81.4	170	77.3	15	6.8	80	36.0	161	73.2	10	4.5

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. In 2009, certain ancestry groups were combined: Lebanese, Iranian, Israeli, and Other Middle Eastern ancestries were combined into "Middle Eastern"; Colombian and Other South American were combined into "South American"; and Nigerian and Other African were combined into "African." 1. In the column "Births," percentages are based on column total (state total of births, including births for which maternal ethnicity is unknown and other). For all other categories, percentages are based on row totals. 2. Low birthweight: less than 2,500 grams or 5.5 pounds. 3. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. 4. Late preterm: 34-36 weeks gestation. 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 6. Gestational diabetes is defined as glucose intolerance found during pregnancy for the first time. It excludes cases with pre-existing diabetes. 7. Calculations based on 1-4 events are excluded. 8. Mothers who selected Native American as their ancestry; this is not one of the largest maternal ancestry groups and was electively included in this chart.

Figure 1. Trends in the Percent of Births by Mother's Age Group, Massachusetts: 1980-2010

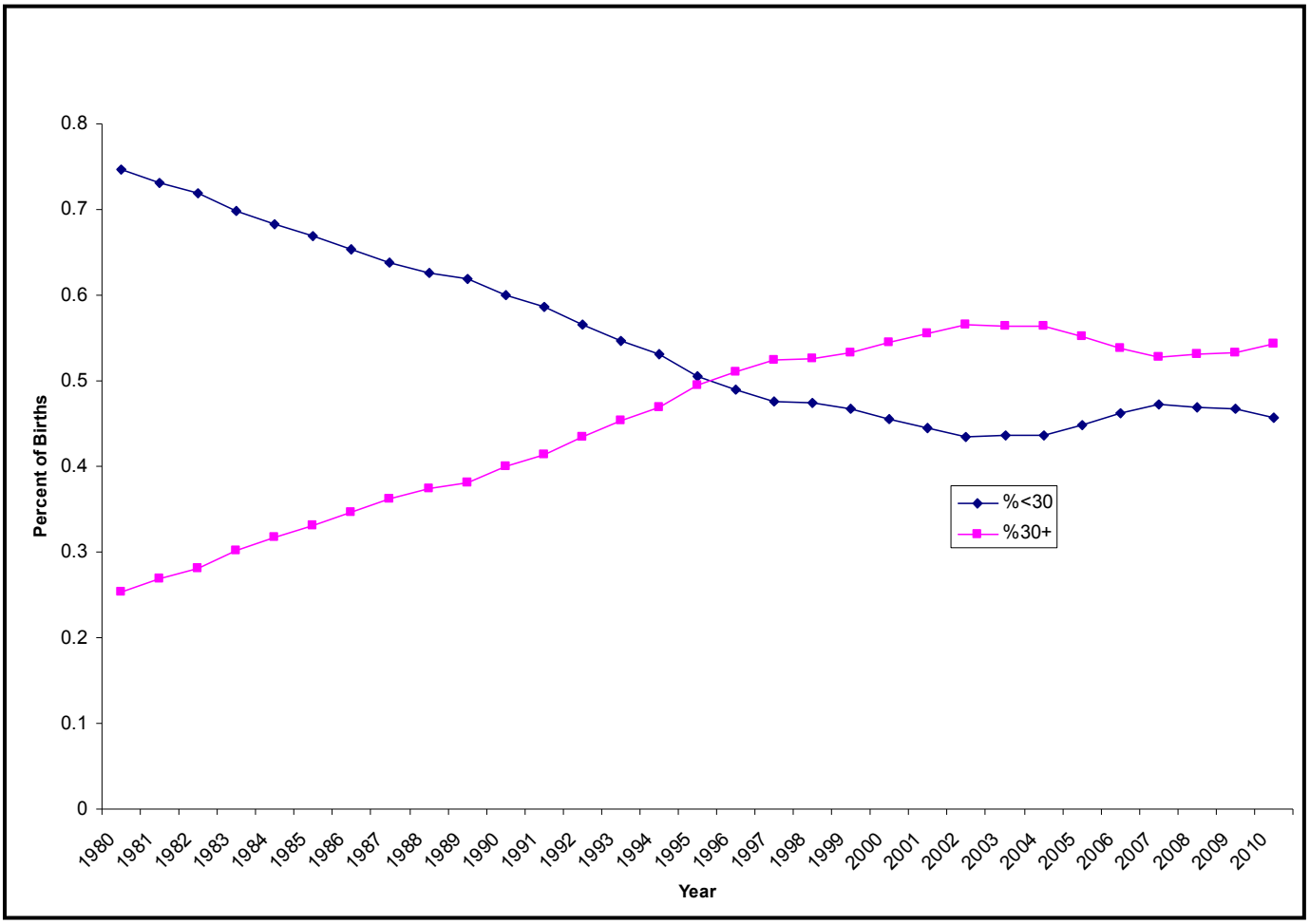


Table 4. Age-Specific and Crude Birth Rates, Massachusetts: 1990 and 2010

	1990		2010		
Mother's Age	**Births[1]**	**Rate**	**Births**	**Rate[2]**	**Percent Change in Rate**
10-14	124	1.3	39	0.2	-84.6%
15-19	7,259	35.1	3,907	17.1	-51.3%
20-24	18,115	69.5	11,298	47.2	-32.1%
25-29	29,913	107.2	18,043	80.8	-24.6%
30-34	25,687	93.9	23,158	112.8	20.1%
35-39	9,795	40.1	13,020	60.7	51.4%
40-44	1,522	6.9	3,160	13.2	91.3%
45+[3]	46	0.3	193	0.7	133.3%
Birth Rate[4] (ages 15-44)	92,290	62.2	72,586	53.7	-13.7%
Crude Birth Rate[5]	92,461	15.4	72,835	11.1	-27.9%

NOTE: All percentages are calculated based on only births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Differences in the number of births from previous publications are the result of updated files. The number of births for all age groups does not always add to the total number of births because mother's age is sometimes not recorded on the birth certificate.
2. Population estimates from the National Center for Health Statistics for 2009 were used to calculate birth rates at the state level.
3. Denominator is the female population ages 45-49.
4. Rate represents the total number of births to women ages 15-44 per 1,000 females in the population ages 15 to 44.
5. Births per 1,000 residents (male and female). Includes births to mothers of all age groups and mothers for whom age is unknown.

Table 5. Trends in Number and Percent Distribution of Births by Plurality and Age Massachusetts: 1996-2010

Age Group / Year	Singletons		Multiples[1]						Total births[2]	
			Twins		Triplets or more		Total Multiples			
	n	%	n	%	n	%	n	%	n	%
All Ages										
1996	77,355	96.5	2,621	3.3	194	0.2	2,815	3.5	80,164	100.0
1997	77,203	96.1	2,856	3.6	262	0.3	3,118	3.9	80,321	100.0
1998	78,004	95.8	3,114	3.8	288	0.4	3,402	4.2	81,406	100.0
1999	77,473	95.8	3,147	3.9	246	0.3	3,393	4.2	80,866	100.0
2000	78,075	95.7	3,263	4.0	244	0.3	3,507	4.3	81,582	100.0
2001	77,409	95.6	3,371	4.2	234	0.3	3,605	4.4	81,014	100.0
2002	76,673	95.1	3,708	4.6	243	0.3	3,951	4.9	80,624	100.0
2003	76,367	95.3	3,551	4.4	249	0.3	3,800	4.7	80,167	100.0
2004	74,677	95.2	3,538	4.5	245	0.3	3,783	4.8	78,460	100.0
2005	73,258	95.4	3,375	4.4	190	0.2	3,565	4.6	76,824	100.0
2006	74,146	95.5	3,375	4.3	149	0.2	3,524	4.5	77,670	100.0
2007	74,498	95.6	3,310	4.2	126	0.2	3,436	4.4	77,934	100.0
2008	73,475	95.5	3,365	4.4	129	0.2	3,494	4.5	76,969	100.0
2009	71,423	95.3	3,386	4.5	157	0.2	3,543	4.7	74,966	100.0
2010	69,508	95.4	3,220	4.4	107	0.1	3,327	4.6	72,835	100.0
Ages <35										
1996	63,560	96.9	1,935	2.9	126	0.2	2,061	3.1	65,621	100.0
1997	62,598	96.7	1,949	3.0	170	0.3	2,119	3.3	64,717	100.0
1998	62,719	96.4	2,193	3.4	170	0.3	2,363	3.6	65,082	100.0
1999	61,816	96.4	2,147	3.3	150	0.2	2,297	3.6	64,113	100.0
2000	61,659	96.4	2,205	3.4	130	0.2	2,335	3.6	63,994	100.0
2001	60,704	96.3	2,211	3.5	134	0.2	2,345	3.7	63,049	100.0
2002	59,736	96.0	2,379	3.8	127	0.2	2,506	4.0	62,242	100.0
2003	59,347	95.9	2,389	3.9	118	0.2	2,507	4.1	61,854	100.0
2004	57,618	96.0	2,229	3.7	142	0.2	2,371	4.0	59,989	100.0
2005	56,380	96.3	2,086	3.6	102	0.2	2,188	3.7	58,569	100.0
2006	57,237	96.3	2,116	3.6	89	0.1	2,205	3.7	59,442	100.0
2007	57,977	96.3	2,144	3.6	87	0.1	2,231	3.7	60,208	100.0
2008	57,080	96.3	2,111	3.6	78	0.1	2,189	3.7	59,269	100.0
2009	55,906	96.1	2,202	3.8	80	0.1	2,282	3.9	58,188	100.0
2010	54,369	96.3	2,018	3.6	58	0.1	2,076	3.7	56,445	100.0
Ages 35+										
1996	13,793	94.8	686	4.7	68	0.5	754	5.2	14,547	100.0
1997	14,602	93.6	907	5.8	92	0.6	999	6.4	15,601	100.0
1998	15,282	93.6	921	5.6	118	0.7	1,039	6.4	16,321	100.0
1999	15,657	93.5	1,000	6.0	96	0.6	1,096	6.5	16,753	100.0
2000	16,412	93.3	1,058	6.0	114	0.6	1,172	6.7	17,584	100.0
2001	16,703	93.0	1,160	6.5	100	0.6	1,260	7.0	17,963	100.0
2002	16,936	92.1	1,329	7.2	116	0.6	1,445	7.9	18,381	100.0
2003	17,015	92.9	1,162	6.3	131	0.7	1,293	7.1	18,308	100.0
2004	17,055	92.4	1,309	7.1	103	0.6	1,412	7.6	18,467	100.0
2005	16,874	92.5	1,289	7.1	88	0.5	1,377	7.5	18,251	100.0
2006	16,901	92.8	1,257	6.9	60	0.3	1,317	7.2	18,218	100.0
2007	16,519	93.2	1,166	6.6	39	0.2	1,205	6.8	17,724	100.0
2008	16,392	92.6	1,254	7.1	51	0.3	1,305	7.4	17,697	100.0
2009	15,513	92.5	1,184	7.1	77	0.5	1,261	7.5	16,774	100.0
2010	15,136	92.4	1,200	7.3	49	0.3	1,249	7.6	16,385	100.0

1. Numbers of multiples (n) represent individual infants rather than sets of infants. 2. Differences in the number of births from previous publications are the result of updated files.

Table 6. Summary of Selected Teen Birth Characteristics, Massachusetts: 2010

	Ages 15-17		Ages 18-19		Combined Ages 15-19	
	N	%[1]	N	%[1]	N	%[1]
State total	1,136	29.1%	2,771	70.9%	3,907	100.0%
Maternal Demographics						
Race/Hispanic Ethnicity	N	%[2]	N	%[2]	N	%[2]
White non-Hispanic	388	34.2%	1,294	46.7%	1,682	43.1%
Black non-Hispanic	161	14.2%	360	13.0%	521	13.3%
Asian	40	3.5%	77	2.8%	117	3.0%
Hispanic	527	46.4%	985	35.6%	1,512	38.7%
Other	19	1.7%	52	1.9%	71	1.8%
Birthplace						
US States / D.C.	887	78.1%	2,190	79.0%	3,077	78.8%
Puerto Rico / US Terr.	108	9.5%	219	7.9%	327	8.4%
Non-US-born	141	12.4%	362	13.1%	503	12.9%
Prenatal care funding						
Public	867	77.6%	2,068	75.7%	2,935	76.2%
Private, other	250	22.4%	665	24.3%	915	23.8%
Pregnancy-Related Factors						
Adequacy of Prenatal Care[3]						
Adequate Total[4]	788	69.4%	2,054	74.1%	2,842	72.7%
Adequate Intensive	372	32.7%	932	33.6%	1,304	33.4%
Adequate Basic	416	36.6%	1,122	40.5%	1,538	39.4%
Intermediate	97	8.5%	247	8.9%	344	8.8%
Inadequate/None	230	20.2%	436	15.7%	666	17.0%
Unknown	21	1.8%	34	1.2%	55	1.4%
Parity[5]						
1	1,070	94.4%	2,313	83.7%	3,383	86.8%
2	62	5.5%	391	14.2%	453	11.6%
3+	2	--[6]	59	2.1%	61	1.6%
Smoking during Pregnancy						
Yes	69	6.1%	311	11.2%	380	9.7%
No	1,066	93.9%	2,457	88.8%	3,523	90.3%
Birth Outcomes						
Birthweight						
< 500 g	1	--[6]	11	0.4%	12	0.3%
500-1,499 g	19	1.7%	36	1.3%	55	1.4%
1,500-2,499 g	91	8.0%	194	7.0%	285	7.3%
LBW (<2,499 g)	111	9.8%	241	8.7%	352	9.0%
2,500-3,999 g	956	84.5%	2,370	85.7%	3,326	85.3%
4000+ g	65	5.7%	155	5.6%	220	5.6%
Gestational age						
< 28 weeks	12	1.1%	28	1.0%	40	1.0%
< 37 weeks	114	10.1%	245	8.9%	359	9.2%
37-42 weeks	1,018	89.9%	2,521	91.1%	3,539	90.8%
43+ weeks	0	0.0%	0	0.0%	0	0.0%
Plurality						
Singleton	1,124	98.9%	2,717	98.1%	3,841	98.3%
Multiple birth	12	1.1%	54	1.9%	66	1.7%

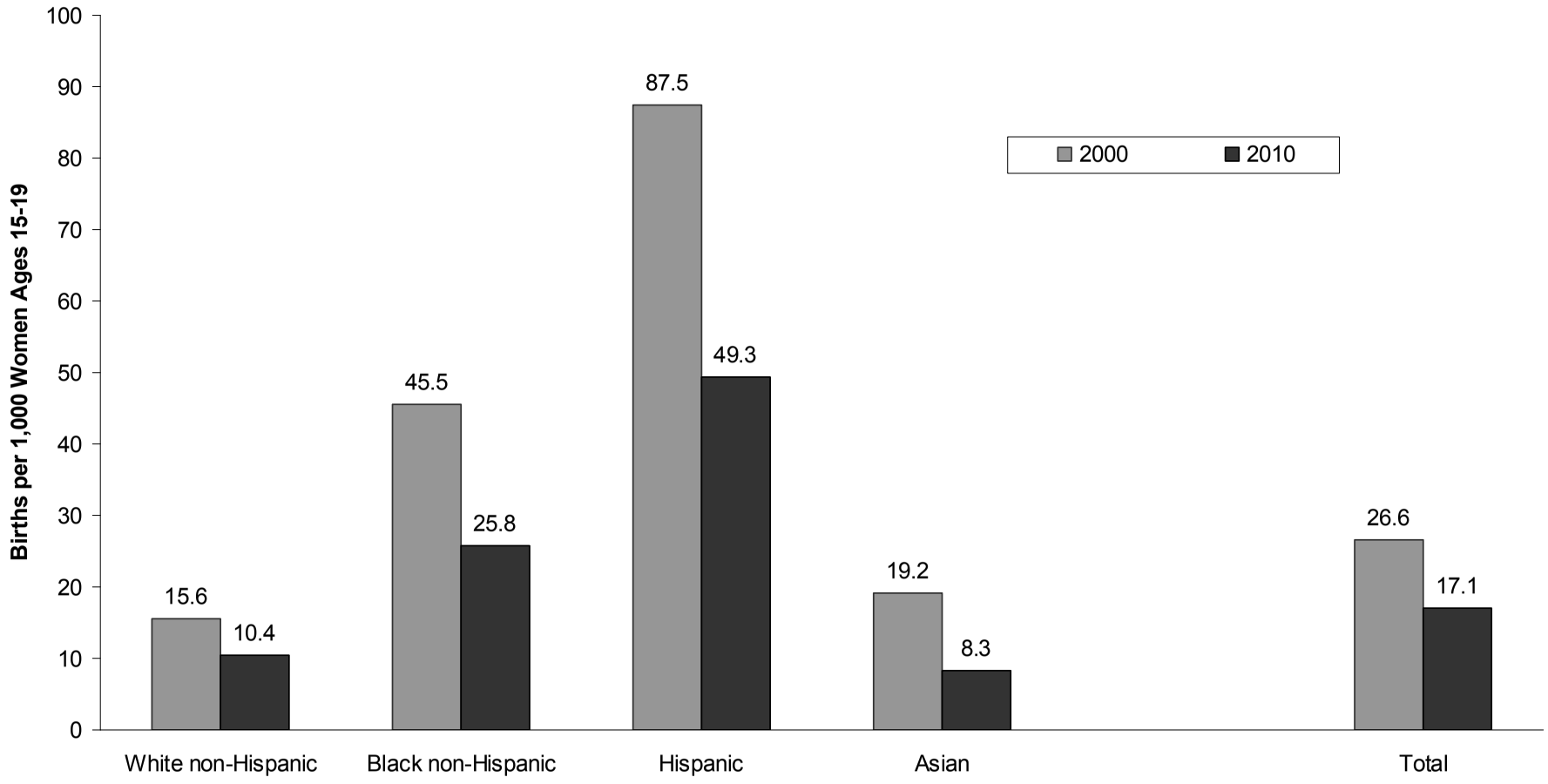
NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. For state total row, percentages are based on total births to females ages 15-19. For the rest of the table, percentages are based on births for a given age group and characteristic. 2. Percents are based on state total of the age group. 3. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. 4. Adequate Total = Adequate Basic + Adequate Intensive. 5. Number of live births including the current birth. 6. Calculations based on 1-4 events are excluded.

Table 7. Trends in Teen Birth Rates for Selected Communities, Ranked by 2010 Teen Birth Rate
Massachusetts: 2000, 2009, 2010

2010 Rank	Municipality[1]	2000		2009		2010	
		Number of Teen Births	Teen Birth Rate[2]	Number of Teen Births	Teen Birth Rate[2,3]	Number of Teen Births	Teen Birth Rate[2,3]
	State Total	**5,305**	**25.9**	**4,583**	**20.1**	**3,907**	**17.1**
1	Holyoke	133	88.3	146	96.9	126	83.6
2	Lawrence	278	96.9	239	70.4	193	56.8
3	Springfield	466	77.1	438	64.1	371	54.3
4	Chelsea	89	81.8	76	63.5	62	51.8
5	Southbridge	38	68.5	31	54.3	28	49.0
6	New Bedford	195	65.3	173	57.0	144	47.4
7	Lynn	189	62.6	172	53.4	149	46.2
8	Lowell	248	63.4	210	51.0	184	44.7
9	Fall River	150	51.4	129	46.4	124	44.6
10	Brockton	218	64.2	137	40.8	119	35.5
11	Pittsfield	58	42.9	70	52.3	46	34.4
12	Fitchburg	92	60.5	64	36.0	58	32.6
13	Worcester	290	41.9	219	28.3	244	31.6
14	Haverhill	68	37.9	70	39.1	56	31.3
15	Taunton	62	37.6	70	40.1	49	28.1
16	Chicopee	56	31.1	72	38.3	52	27.6
17	Leominster	63	51.6	41	31.3	34	26.0
18	Revere	35	29.2	56	39.1	37	25.8
19	Everett	20	19.3	37	28.1	32	24.3
20	Framingham	45	23.5	50	21.3	52	22.1
21	Attleboro	47	40.8	39	29.0	29	21.6
22	Boston	785	35.5	521	20.0	503	19.4
23	Salem	34	27.8	20	12.7	29	18.5
24	Somerville	47	22.5	40	23.4	30	17.5
25	Quincy	39	20.0	23	11.6	31	15.6

1. Selected communities include the 25 Massachusetts cities and towns with the greatest number of teen births. Ranking is by 2010 teen birth rate. 2. Rates are per 1,000 females ages 15-19 per city/town. 3. Birth rates for cities and towns were calculated using Census 2010 data.

Figure 2. Birth Rates among Females Ages 15-19 Years by Mother's Race/Hispanic Ethnicity, Massachusetts: 2000 and 2010



Note: Teen birth rate is number of births to females ages 15-19 per 1,000 females ages 15-19. Birth rates are based upon the 2000 and 2010 Census population.

Table 8. Births by Birthweight, Race/Hispanic Ethnicity, Massachusetts: 2010

Birthweight (in grams)	Total		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other		Unknown race/ethnicity
	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n
State Total	**72,835**	**100.0**	**48,466**	**100.0**	**6,794**	**100.0**	**10,588**	**100.0**	**5,817**	**100.0**	**1,083**	**100.0**	**87**
<500	103	0.1	46	0.1	24	0.4	18	0.2	12	0.2	1	--[2]	2
500-999	351	0.5	190	0.4	62	0.9	61	0.6	33	0.6	3	--[2]	2
1,000-1,499	507	0.7	294	0.6	73	1.1	87	0.8	36	0.6	14	1.3	3
1,500-1,999	1,112	1.5	708	1.5	129	1.9	170	1.6	83	1.4	21	1.9	1
2,000-2,499	3,577	4.9	2,173	4.5	452	6.7	557	5.3	338	5.8	55	5.1	2
2,500-2,999	12,074	16.6	7,131	14.7	1,386	20.4	2,007	19.0	1,339	23.0	198	18.3	13
3,000-3,499	27,583	37.9	17,836	36.9	2,591	38.2	4,338	41.0	2,366	40.7	431	39.8	21
3,500-3,999	20,780	28.6	14,892	30.8	1,623	23.9	2,651	25.1	1,326	22.8	275	25.4	13
4,000-4,499	5,670	7.8	4,369	9.0	385	5.7	584	5.5	254	4.4	76	7.0	2
4,500-4,999	909	1.2	731	1.5	53	0.8	92	0.9	25	0.4	8	0.7	0
>=5,000	96	0.1	68	0.1	12	0.2	13	0.1	2	--[2]	1	--[2]	0
Unknown birthweight	73	0.1	28	0.1	4	--[2]	10	0.1	3	--[2]	0	0.0	28
VLBW[3] (0-1,499 g)	961	1.3	530	1.1	159	2.3	166	1.6	81	1.4	18	1.7	7
LBW[4] (0-2,499 g)	5,650	7.8	3,411	7.0	740	10.9	893	8.4	502	8.6	94	8.7	10

NOTE: Percentages for detailed birthweight rows ("<500" through "Unknown birthweight") are calculated based on births including those with unknown birthweight. Percentages for VLBW and LBW rows are calculated based on births with known birthweight only.

1. Percentages are based on column totals. 2. Calculations based on values of 1-4 are excluded. 3. Very Low Birthweight (VLBW): less than 1,500 grams (3.3 lbs.). 4. Low Birthweight (LBW): less than 2,500 grams (5.5 lbs.).

Table 9. Low Birthweight by Plurality and Maternal Age, Massachusetts: 2000-2010

Age Group (years)	Year	Singleton				Multiples												Total Births			
						Twin				Triplets or more				Total Multiples							
		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
All Ages	2000	722	0.9	3,886	5.1	284	8.9	1,603	50.0	84	35.0	222	92.5	368	10.7	1,825	53.0	1,090	1.4	5,711	7.1
	2001	730	0.9	3,931	5.1	310	9.2	1,654	49.2	74	32.9	210	93.3	384	10.7	1,864	52.0	1,114	1.4	5,795	7.2
	2002	699	0.9	3,972	5.2	342	9.2	1,855	50.2	68	28.0	233	95.9	410	10.4	2,088	53.0	1,109	1.4	6,060	7.5
	2003	713	0.9	4,006	5.3	331	9.3	1,877	52.9	71	28.5	232	93.2	402	10.6	2,109	55.6	1,115	1.4	6,115	7.6
	2004	740	1.0	4,015	5.4	324	9.2	1,879	53.2	84	34.4	231	94.7	408	10.8	2,110	55.9	1,148	1.5	6,125	7.8
	2005	701	1.0	4,126	5.6	322	9.5	1,765	52.3	75	39.5	181	95.3	397	11.1	1,946	54.6	1,098	1.4	6,072	7.9
	2006	687	0.9	4,264	5.8	308	9.1	1,746	51.8	46	31.1	140	94.6	354	10.1	1,886	53.6	1,041	1.3	6,150	7.9
	2007	693	0.9	4,258	5.7	306	9.2	1,772	53.6	54	42.9	117	92.9	360	10.5	1,889	55.0	1,053	1.4	6,147	7.9
	2008	627	0.9	4,039	5.5	324	9.7	1,803	53.8	55	42.6	113	87.6	379	10.9	1,916	55.1	1,006	1.3	5,955	7.8
	2009	677	1.0	3,886	5.5	276	8.2	1,771	52.7	61	38.9	147	93.6	337	9.6	1,918	54.5	1,014	1.4	5,804	7.8
	2010	643	0.9	3882	5.6	288	8.9	1,668	51.8	30	28.8	100	96.2	318	9.6	1,768	53.2	961	1.3	5,650	7.8
Ages < 35	2000	555	0.9	3,096	5.1	204	9.4	1,097	50.7	49	38.0	125	96.9	253	11.0	1,222	53.3	808	1.3	4,318	6.9
	2001	576	1.0	3,147	5.2	235	10.7	1,156	52.4	41	31.3	120	91.6	276	11.8	1,276	54.6	852	1.4	4,423	7.0
	2002	537	0.9	3,129	5.2	237	10.0	1,229	51.9	42	33.1	125	98.4	279	11.2	1,354	54.2	816	1.3	4,483	7.2
	2003	539	0.9	3,161	5.3	256	10.7	1,325	55.5	38	32.2	114	96.6	294	11.7	1,439	57.5	833	1.3	4,600	7.5
	2004	565	1.0	3,128	5.4	207	9.3	1,224	55.0	56	39.7	133	94.3	263	11.1	1,357	57.3	828	1.4	4,485	7.5
	2005	552	1.0	3,198	5.7	215	10.3	1,149	55.1	47	46.1	100	98.0	262	12.0	1,249	57.1	814	1.4	4,447	7.6
	2006	534	0.9	3,342	5.8	217	10.3	1,157	54.8	28	31.5	83	93.3	245	11.1	1,240	56.3	779	1.3	4,582	7.7
	2007	533	0.9	3,317	5.7	223	10.4	1,191	55.6	45	51.7	85	97.7	268	12.0	1,276	57.2	801	1.3	4,593	7.6
	2008	492	0.9	3,134	5.5	218	10.4	1,181	56.2	34	43.6	70	89.7	252	11.6	1,251	57.4	744	1.3	4,385	7.4
	2009	525	0.9	3,093	5.6	174	7.9	1,187	54.2	36	45.0	76	95.0	210	9.2	1,263	55.6	735	1.3	4,356	7.5
	2010	489	0.9	3,071	5.7	206	10.2	1,059	52.5	22	40.0	51	92.7	228	11.0	1,110	53.5	717	1.3	4,181	7.4
Ages 35+	2000	167	1.0	790	4.9	80	7.7	506	48.6	35	31.5	97	87.4	115	10.0	603	52.3	282	1.6	1,393	8.1
	2001	154	0.9	784	4.7	75	6.5	498	43.2	33	35.1	90	95.7	108	8.7	588	47.2	262	1.5	1,372	7.7
	2002	161	1.0	842	5.0	105	7.9	626	47.1	26	22.4	108	93.1	131	9.1	734	50.8	292	1.6	1,576	8.6
	2003	174	1.0	844	5.0	75	6.5	552	47.5	33	25.2	118	90.1	108	8.4	670	51.9	282	1.5	1,514	8.3
	2004	174	1.0	886	5.2	117	9.0	655	50.2	28	27.2	98	95.1	145	10.3	753	53.5	319	1.7	1,639	8.9
	2005	149	0.9	927	5.5	107	8.3	616	47.8	28	31.8	81	92.0	135	9.8	697	50.6	284	1.6	1,624	8.9
	2006	151	0.9	919	5.4	89	7.1	587	46.8	18	30.5	57	96.6	107	8.1	644	49.0	258	1.4	1,563	8.6
	2007	160	1.0	941	5.7	83	7.1	581	49.8	9	23.1	32	82.1	92	7.6	613	50.9	252	1.4	1,554	8.8
	2008	135	0.8	905	5.6	106	8.5	622	49.8	21	41.2	43	84.3	127	9.8	665	51.2	262	1.5	1,570	8.9
	2009	152	1.0	792	5.1	102	8.7	584	49.9	25	32.5	71	92.2	127	10.2	655	52.5	279	1.7	1,447	8.7
	2010	154	1.0	810	5.4	82	6.8	609	50.8	8	16.3	49	100.0	90	7.2	658	52.8	244	1.5	1,468	9.0

NOTE: Very Low Birthweight (VLBW) births are a subset of Low Birthweight (LBW) births. All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. 1. Very Low Birthweight (VLBW): less than 1,500 grams (3.3 lbs.). 2. Low Birthweight (LBW): less than 2,500 grams (5.5 lbs.).

Table 10a. Births by Gestational Age, Race/Hispanic Ethnicity, Massachusetts: 2010

Gestational Age[1] (weeks completed)	Total		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[3]		Unknown
	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n
State Total	**72,835**	**100.0**	**48,466**	**100.0**	**6,794**	**100.0**	**10,588**	**100.0**	**5,817**	**100.0**	**1,083**	**100.0**	**87**
<20	18	0.0	4	--[4]	1	--[4]	9	0.1	3	--[4]	1	0.0	1
20-23	118	0.2	57	0.1	24	0.4	22	0.2	12	0.2	1	--[4]	2
24-27	300	0.4	163	0.3	56	0.8	47	0.4	26	0.4	7	0.6	1
28-31	625	0.9	380	0.8	74	1.1	112	1.1	42	0.7	15	1.4	2
32-33	812	1.1	538	1.1	95	1.4	111	1.0	56	1.0	11	1.0	1
34-36	4,361	6.0	2,832	5.8	469	6.9	664	6.3	333	5.7	57	5.3	6
37-38	15,361	21.1	9,788	20.2	1,465	21.6	2,446	23.1	1,422	24.4	226	20.9	14
39	23,058	31.7	15,420	31.8	2,059	30.3	3,300	31.2	1,925	33.1	341	31.5	13
40	20,128	27.6	13,627	28.1	1,797	26.4	2,876	27.2	1,506	25.9	312	28.8	10
41	7,498	10.3	5,280	10.9	702	10.3	945	8.9	458	7.9	107	9.9	6
42	479	0.7	341	0.7	47	0.7	52	0.5	32	0.6	6	0.6	1
43	11	0.0	9	0.0	1	--[4]	0	0.0	1	--[4]	0	0.0	0
44+	66	0.1	27	0.1	4	--[4]	4	--[4]	1	--[4]	0	0.0	30
Preterm[5] (<37)	**6,234**	**8.6**	**3,974**	**8.2**	**719**	**10.6**	**965**	**9.1**	**472**	**8.1**	**91**	**8.4**	**13**
Very Early[6] (<28)	436	0.6	224	0.5	81	1.2	78	0.7	41	0.7	8	0.7	4
(28-33)	1,437	2.0	918	1.9	169	2.5	223	2.1	98	1.7	26	2.4	3
Late (34-36)	4,361	6.0	2,832	5.8	469	6.9	664	6.3	333	5.7	57	5.3	6
Term (>=37)	**66,601**	**91.4**	**44,492**	**91.8**	**6,075**	**89.4**	**9,623**	**90.9**	**5,345**	**91.9**	**992**	**91.6**	**74**
Early Term (37-38)	15,361	21.1	9,788	20.2	1,465	21.6	2,446	23.1	1,422	24.4	226	20.9	14
(39-41)	50,684	69.6	34,327	70.8	4,558	67.1	7,121	67.3	3,889	66.9	760	70.2	29
(>=42)	556	0.8	377	0.8	52	0.8	56	0.5	34	0.6	6	0.6	31
Unknown[7]	422		295		8		46		11		7		55

NOTE: Percentages are calculated based on births with known gestational age only.

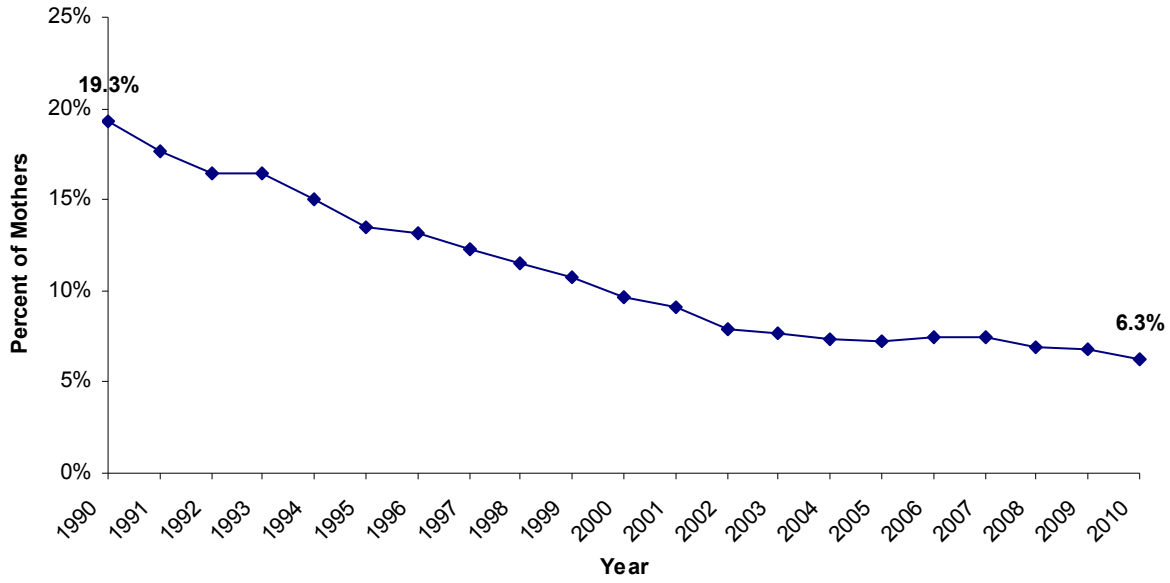
1. A clinical estimate of the number of weeks of pregnancy completed; as estimated by the attendant at birth or the postnatal physician. 2. Percentages are based on column total. 3. Other races include American Indian and others not specified. 4. Calculations based on values of 1-4 are excluded. 5. Also known as early gestational age, premature delivery, or preterm delivery. 6. Also known as extremely premature delivery, or extremely preterm delivery. 7. Estimate of gestational age not provided and excluded from percentage calculations.

Table 10b. Preterm and Term Births by Gestational Age Category, Massachusetts: 1999-2010

	Preterm			Term[1]	
Year	very early preterm (<28 wks)	moderate preterm (28-33 wks)	late preterm (34-36 wks)	early term (37-38 wks)	full term (37+ wks)
1999	0.6	1.9	5.2	17.1	92.4
2000	0.6	2.0	5.7	18.7	91.7
2001	0.6	1.9	5.5	18.8	92.0
2002	0.6	1.9	5.9	20.0	91.5
2003	0.7	2.1	6.0	20.8	91.3
2004	0.6	2.2	6.4	22.3	90.8
2005	0.6	2.1	6.3	22.3	91.0
2006	0.6	2.0	6.3	22.7	91.0
2007	0.6	2.0	6.4	22.6	91.0
2008	0.6	2.0	6.2	22.6	91.2
2009	0.7	1.9	6.2	20.8	91.3
2010	0.6	2.0	6.0	21.1	91.4

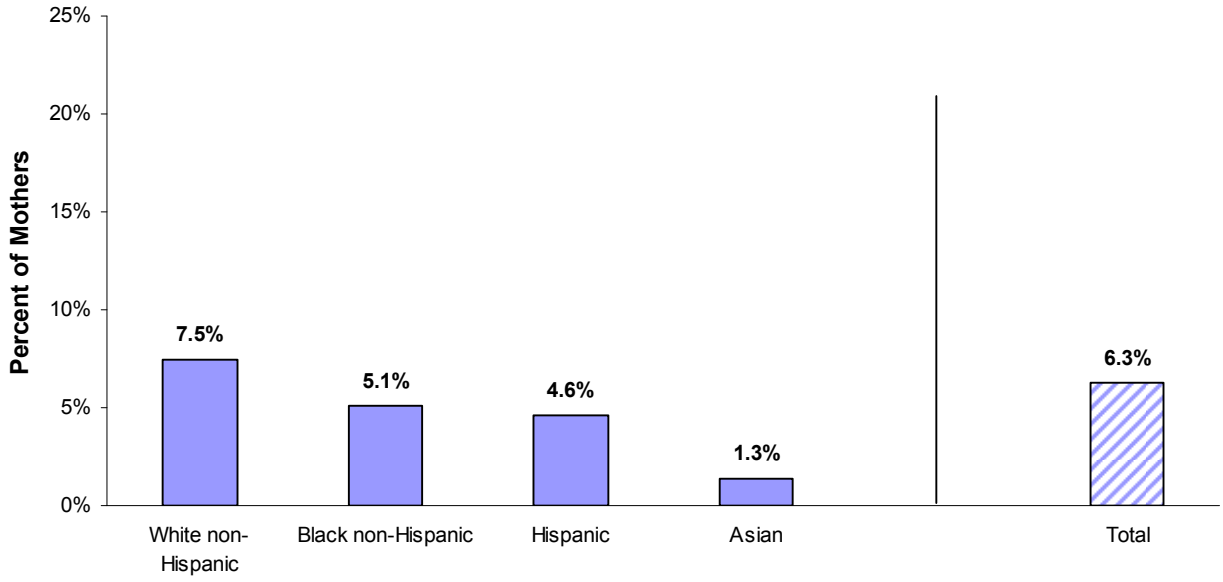
[1] Note: Full term and early term are not mutually exclusive.

Figure 3. Percent of Mothers who Reported Smoking during Pregnancy Massachusetts: 1990-2010



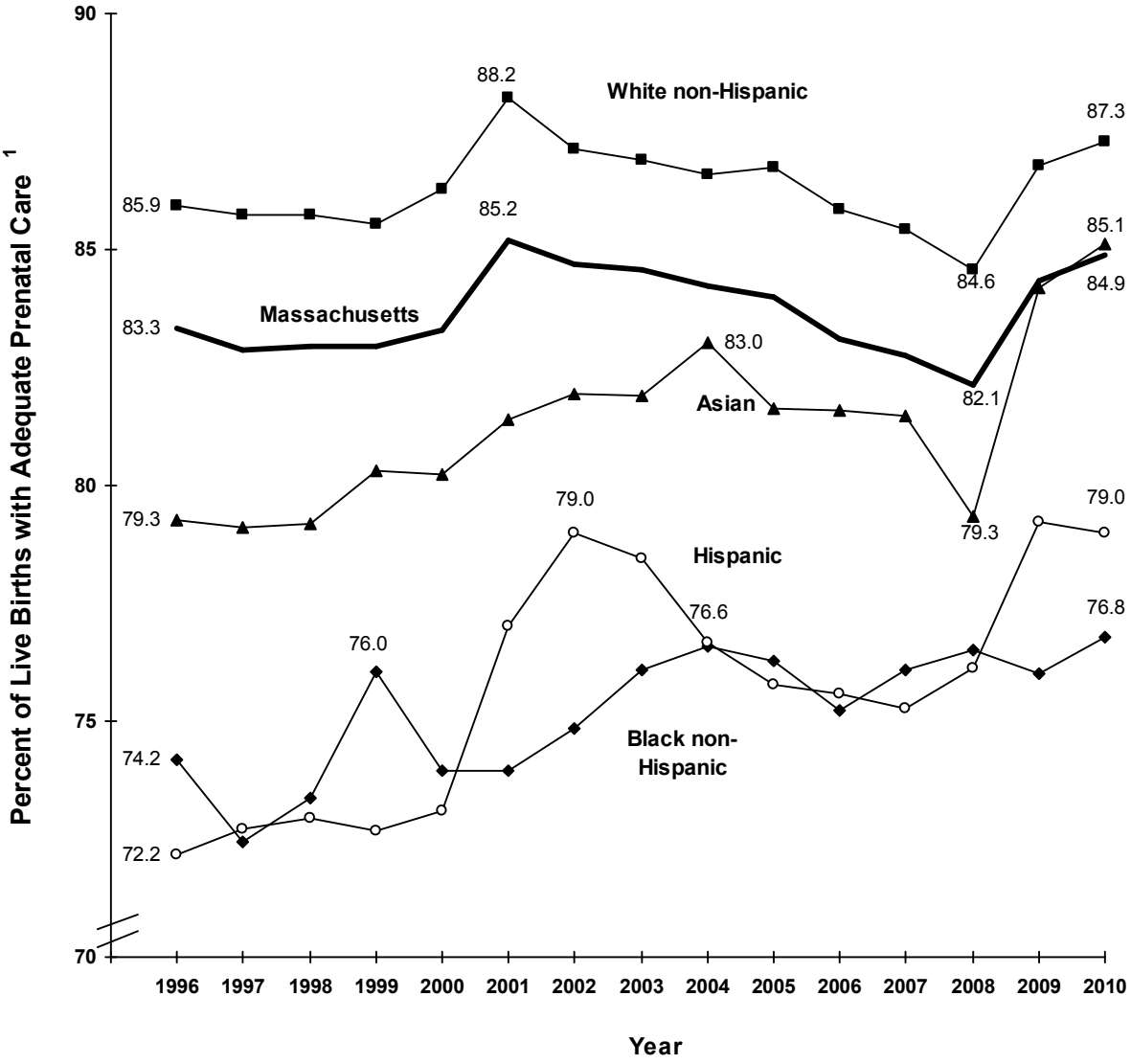
Note: Smoking information is provided on the birth certificate as reported by the mother. Due to self-reported nature, data on smoking prevalence should be interpreted cautiously.

Figure 4. Percent of Mothers who Reported Smoking during Pregnancy by Mother's Race/Hispanic Ethnicity, Massachusetts: 2010



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Asian data should be interpreted with caution because of small numbers. Smoking information is provided on the birth certificate as reported by the mother. Due to self-reported nature, data on smoking prevalence should be interpreted cautiously.

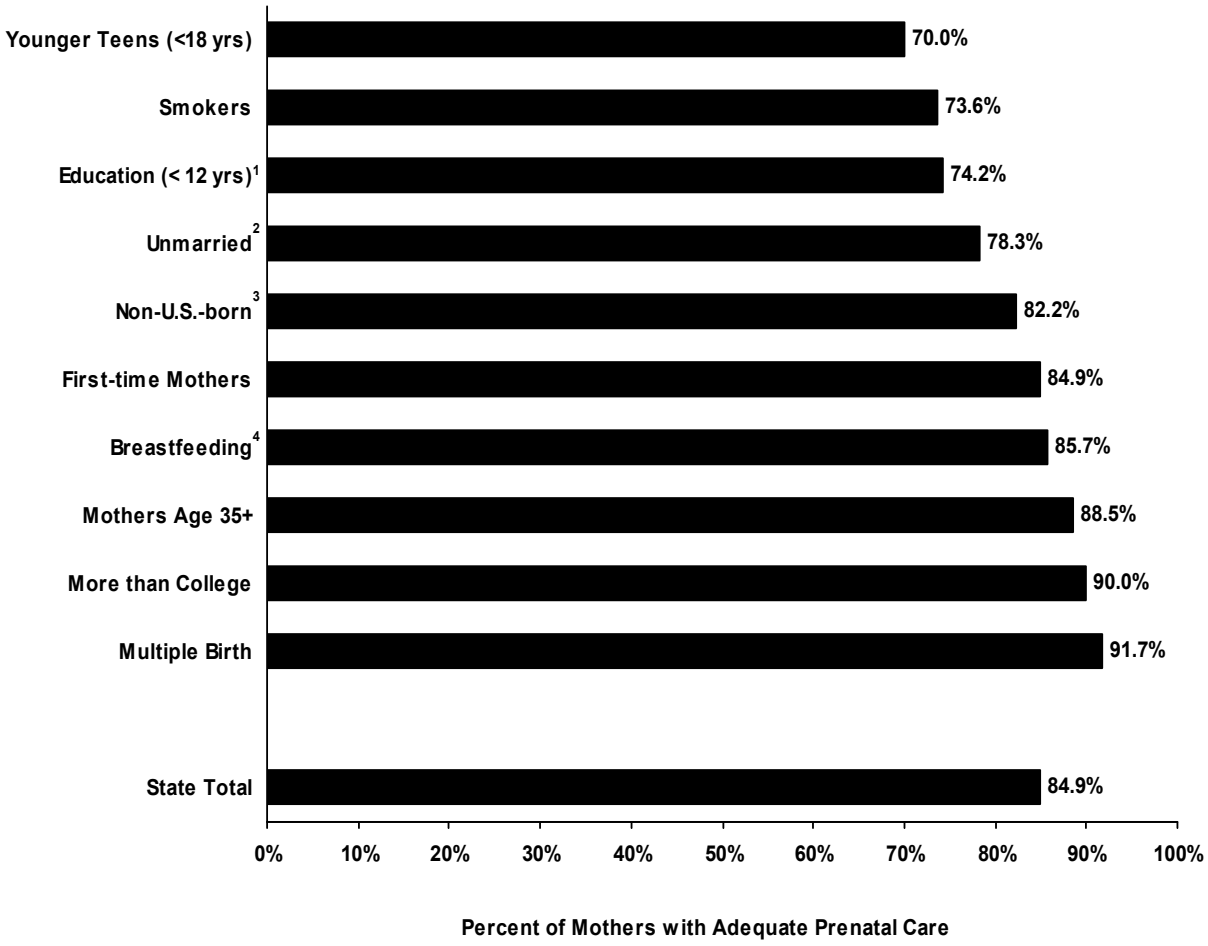
Figure 5. Trends in Adequacy of Prenatal Care by Race and Hispanic Ethnicity, Massachusetts: 1996-2010



PLEASE NOTE THAT FOR PURPOSES OF VISUAL REPRESENTATION THE VERTICAL SCALE OF GRAPH REPRESENTS A SMALL INTERVAL (from 70% to 90%).

1. All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Please note that the Adequacy of Prenatal Care Utilization (APNCU) Index is an assessment of the timing and number of prenatal care visits and not an evaluation of the quality of care delivered.

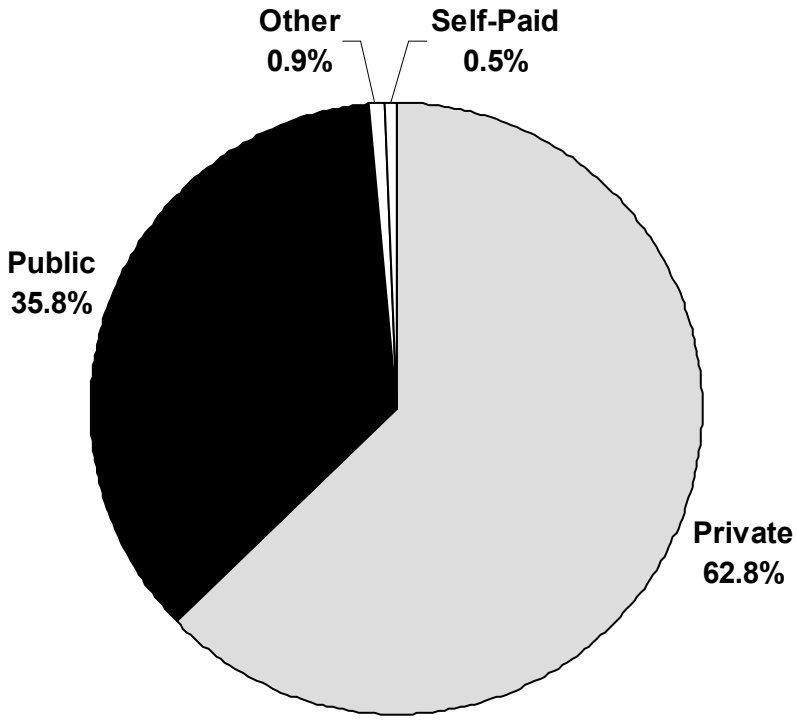
Figure 6. Adequacy of Prenatal Care by Selected Maternal Characteristics, Massachusetts: 2010



NOTE: All percentages are calculated based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Characteristics of interest are not mutually exclusive, except as noted.

1. Women 20 years of age and older. 2. Marital status at time of birth. 3. Non-US-born includes women born outside of the 50 U.S. states, District of Columbia, and U.S. territories (Puerto Rico, U.S. Virgin Islands, Guam).
4. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

Figure 7. Distribution of Prenatal Care Payment Source, Massachusetts: 2010



NOTE: Sources of Prenatal Care Payment include private: Commercial indemnity plan, commercial managed care (HMO, PPO, IPP, IPA, and other), or other private insurance; public: Government programs including Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may also be HMO or managed care), or free care; and other: Worker's Compensation and other sources.

Table 11. Trends in Infant, Neonatal, and Post Neonatal Mortality by Race/Hispanic Ethnicity, Massachusetts: 1992-2010

INFANT MORTALITY (less than one year of age)

	State Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[2]	
Year	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]
1992	569	6.5	371	5.5	110	16.4	67	7.9	16	4.9	5	5.1
1993	523	6.2	346	5.3	84	13.1	77	9.3	13	3.9	3	--[4]
1994	499	6.0	343	5.3	79	12.6	64	7.6	8	2.4	5	5.3
1995	419	5.1	275	4.4	65	11.1	58	7.2	19	5.5	2	--[4]
1996	403	5.0	289	4.7	63	11.4	40	5.1	8	2.2	2	--[4]
1997	425	5.3	294	4.8	64	11.7	55	6.7	10	2.6	2	--[4]
1998	414	5.1	287	4.6	59	10.6	58	6.7	10	2.7	0	0.0
1999	418	5.2	285	4.7	72	12.3	49	5.5	8	1.9	4	--[4]
2000	377	4.6	232	3.8	74	12.8	48	5.2	19	4.1	4	--[4]
2001	407	5.0	245	4.1	71	12.1	69	7.3	15	3.1	7	4.1
2002	397	4.9	239	4.1	69	11.6	67	7.0	16	3.0	6	3.8
2003	383	4.8	235	4.1	75	12.7	55	5.6	14	2.7	4	--[4]
2004	376	4.8	210	3.8	70	11.5	75	7.6	15	2.7	6	3.5
2005	391	5.1	230	4.3	57	9.4	78	7.7	18	3.4	8	4.3
2006	369	4.8	221	4.2	72	11.1	62	5.8	10	1.8	3	--[4]
2007	380	4.9	206	3.9	66	10.2	81	7.4	18	3.1	4	--[4]
2008	382	5.0	194	3.7	78	11.7	86	7.9	16	2.7	8	5.1
2009	366	4.9	205	4.1	54	7.8	78	7.1	20	3.4	9	7.8
2010	319	4.4	163	3.4	56	8.2	65	6.1	25	4.3	7	6.5

NEONATAL MORTALITY (birth to 27 days)

	State Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[2]	
Year	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]
1992	415	4.8	274	4.0	76	11.4	51	6.0	10	3.0	4	--[4]
1993	375	4.4	245	3.7	64	10.0	55	6.7	9	2.7	2	--[4]
1994	349	4.2	240	3.7	58	9.3	40	4.7	7	2.1	4	--[4]
1995	298	3.6	198	3.1	50	8.5	39	4.8	10	2.9	1	--[4]
1996	290	3.6	222	3.6	34	6.2	27	3.5	5	1.4	1	--[4]
1997	323	4.0	228	3.7	44	8.0	43	5.2	7	1.8	1	--[4]
1998	315	3.9	218	3.5	47	8.5	43	5.0	7	1.9	0	0.0
1999	332	4.1	226	3.7	58	9.9	39	4.4	5	1.2	4	--[4]
2000	288	3.5	177	2.9	57	9.9	37	4.0	14	3.0	3	--[4]
2001	308	3.8	190	3.2	56	9.5	49	5.2	10	2.1	3	--[4]
2002	299	3.7	185	3.2	49	8.2	50	5.2	13	2.4	2	--[4]
2003	285	3.6	179	3.1	56	9.5	38	3.9	10	1.9	2	--[4]
2004	291	3.7	167	3.0	51	8.4	57	5.8	12	2.2	4	--[4]
2005	282	3.7	168	3.1	40	6.6	57	5.8	11	2.1	5	2.7
2006	279	3.6	173	3.3	53	8.2	42	3.9	7	1.3	3	--[4]
2007	263	3.4	141	2.7	48	7.4	53	4.9	15	2.6	4	--[4]
2008	291	3.8	153	3.0	57	8.6	65	6.0	10	1.7	6	3.8
2009	276	3.7	162	3.2	36	5.2	54	4.9	17	2.9	7	6.0
2010	238	3.3	121	2.5	43	6.3	47	4.4	20	3.4	5	4.6

Table 11 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality by Race/ Hispanic Ethnicity, Massachusetts: 1992-2010

POST NEONATAL MORTALITY (28-364 days)

	State Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[2]	
Year	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**
1992	154	1.8	97	1.4	34	5.1	16	1.9	6	1.8	1	--[4]
1993	148	1.7	101	1.5	20	3.1	22	2.7	4	--[4]	1	--[4]
1994	150	1.8	103	1.6	21	3.3	24	2.8	1	--[4]	1	--[4]
1995	121	1.5	77	1.2	15	2.6	19	2.3	9	2.6	1	--[4]
1996	113	1.4	67	1.1	29	5.3	13	1.7	3	--[4]	1	--[4]
1997	102	1.3	66	1.1	20	3.7	12	1.5	3	--[4]	1	--[4]
1998	99	1.2	69	1.1	12	2.2	15	1.7	3	--[4]	0	0.0
1999	86	1.1	59	1.0	14	2.4	10	1.1	3	--[4]	0	0.0
2000	89	1.1	55	0.9	17	2.9	11	1.2	5	1.1	1	--[4]
2001	99	1.2	55	0.9	15	2.6	20	2.1	5	1.0	4	--[4]
2002	98	1.2	54	0.9	20	3.4	17	1.8	3	--[4]	4	--[4]
2003	98	1.2	56	1.0	19	3.2	17	1.7	4	--[4]	2	--[4]
2004	85	1.1	43	0.8	19	3.1	18	1.8	3	--[4]	2	--[4]
2005	109	1.4	62	1.2	17	2.8	20	2.0	7	1.3	3	--[4]
2006	90	1.2	48	0.9	19	2.9	20	1.9	3	--[4]	0	0.0
2007	117	1.5	65	1.2	18	2.8	28	2.6	3	--[4]	3	--[4]
2008	91	1.2	41	0.8	21	3.2	21	1.9	6	1.0	2	--[4]
2009	90	1.2	43	0.9	18	2.6	24	2.2	3	--[4]	2	--[4]
2010	81	1.1	42	0.9	13	1.9	18	1.7	5	0.9	2	--[4]

Note that infant deaths are based on the death file as June 27, 2012.
1. Deaths of infants of unknown race are included in the total calculation. For rate computations, births of infants of unknown race are allocated into the race categories according to the distribution of births of known race. 2. Other: American Indian and Other races. 3. Rates are expressed per 1,000 live births.
4. Calculations based on values of 1-4 are excluded.

Figure 8. Infant Mortality Rates by Race/Hispanic Ethnicity, Massachusetts: 2010

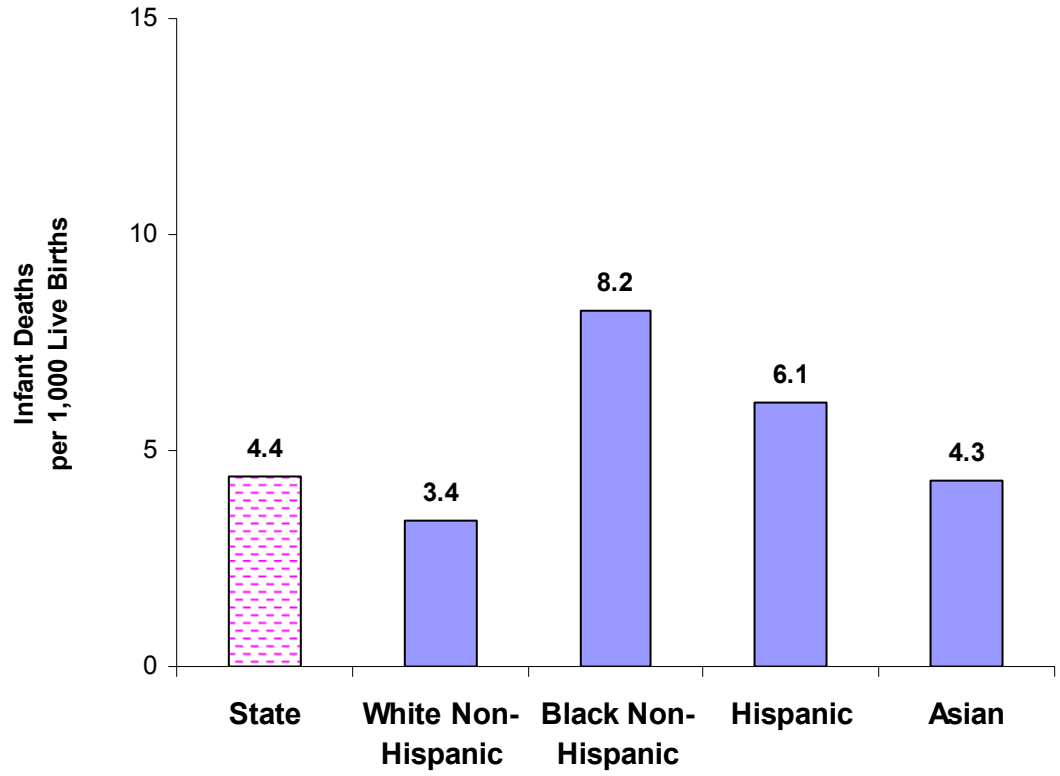


Table 12. Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2010

Municipality[1]	Rank (by pop. size)	Population	Crude Birth Rate[2]	Mother's Race and Ethnicity				Birth weight		Gestational Diabetes
				White non-Hispanic %[3]	Black non-Hispanic %[3]	Hispanic %[3]	Asian or Other[4] %[3]	Very Low (<1500 g) %	Low (<2500 g) %	%
STATE TOTAL		**6,547,629**	**11.1**	**66.5**	**9.3**	**14.5**	**9.5**	**1.3**	**7.8**	**4.7**
Arlington	30	42,839	14.4	80.4	2.8	2.1	14.7	1.1	7.1	2.9
Attleboro	29	43,585	12.0	78.2	3.2	9.7	8.8	1.3	6.3	1.7
Barnstable	27	45,185	8.9	81.4	5.7	6.7	6.2	1.2	6.2	2.0
Boston	1	617,594	12.7	40.8	27.5	21.7	9.9	1.6	9.4	3.8
Brockton	7	93,802	15.1	31.2	52.3	11.7	4.7	2.0	8.8	5.3
Brookline	18	58,730	11.8	66.8	2.6	4.0	25.8	0.9	6.8	3.6
Cambridge	5	105,157	11.6	57.1	13.6	7.1	22.2	0.5	7.3	3.9
Chicopee	22	55,295	11.2	65.8	5.1	26.0	3.1	1.1	6.6	6.8
Fall River	10	88,844	13.0	78.7	5.7	10.8	4.7	1.5	8.8	7.5
Framingham	14	68,314	14.1	64.7	6.4	17.7	11.1	1.9	10.6	6.0
Haverhill	15	60,876	13.6	74.8	3.8	18.6	2.8	1.6	8.5	4.9
Lawrence	12	76,368	18.0	12.6	2.7	82.4	2.3	1.2	7.0	3.4
Lowell	4	106,517	15.8	42.2	8.5	21.3	28.0	1.7	9.1	6.7
Lynn	9	90,328	16.0	29.7	11.4	47.5	11.4	1.3	7.7	4.7
Malden	17	59,447	15.5	43.3	18.3	7.6	30.9	1.8	8.3	5.9
Medford	20	56,171	13.0	69.2	12.7	4.5	13.5	0.5	7.7	4.5
Methuen	26	47,252	11.9	63.5	2.8	28.4	5.3	1.4	6.9	4.3
New Bedford	6	95,071	13.5	61.1	13.4	23.6	2.0	1.4	7.6	4.9
Newton	11	85,142	9.2	72.6	3.0	5.7	18.6	1.0	7.0	3.4
Peabody	25	51,253	9.5	78.1	2.9	10.6	8.4	0.2	5.5	3.8
Pittsfield	28	44,728	11.4	80.2	7.8	7.5	4.5	1.6	9.2	3.7
Plymouth	19	56,455	9.9	92.1	1.8	2.1	3.9	0.5	6.4	3.2
Quincy	8	92,275	13.1	55.5	8.9	2.7	32.7	1.3	6.3	5.5
Revere	24	51,744	14.6	50.9	8.2	30.8	9.9	1.1	8.5	5.2
Somerville	13	75,748	12.4	61.2	8.0	13.8	16.8	1.4	8.0	4.7
Springfield	3	153,057	14.9	22.5	20.9	52.8	3.7	1.7	9.8	5.8
Taunton	21	55,869	12.4	79.9	10.3	6.1	3.6	1.4	9.2	4.5
Waltham	16	60,621	13.1	53.7	8.6	21.4	16.4	0.6	6.9	4.5
Weymouth	23	53,736	11.6	82.6	5.5	3.1	7.6	1.9	6.9	4.4
Worcester	2	181,041	13.7	60.4	15.5	16.8	7.3	1.6	8.0	5.1

Table 12 (cont'd). Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2010

Municipality[1]	Births					Deaths			
	Adequate Prenatal Care[6]	Public Payment[7] for Prenatal Care	Unmarried	Teen Mothers 15-19 years		Infant Mortality Rate[9]		Neonatal Mortality Rate[9]	
	%	%	%	n	Rate[8]	2010	2008-2010	2010	2008-2010
STATE TOTAL	**84.9**	**35.8**	**34.6**	**3,907**	**17.1**	**4.4**	**4.7**	**3.3**	**3.6**
Arlington	91.1	7.3	7.3	4	--	6.5	3.3	4.9	2.8
Attleboro	87.7	23.1	38.7	29	21.6	5.7	1.8	3.8	1.2
Barnstable	80.8	49.5	37.5	24	18.8	7.4	3.2	5.0	1.6
Boston	85.6	43.0	42.6	503	19.4	3.7	3.6	3.3	2.8
Brockton	76.2	63.1	55.4	119	35.5	7.1	5.6	4.9	4.5
Brookline	89.3	6.7	6.1	4	--	1.4	1.0	1.4	1.0
Cambridge	86.6	16.4	14.9	15	4.2	1.6	1.1	1.6	0.5
Chicopee	81.8	54.0	52.3	52	27.6	1.6	1.1	.	0.5
Fall River	84.8	70.4	63.6	124	44.6	5.2	4.2	5.2	3.3
Framingham	91.5	42.7	33.7	52	22.1	5.2	3.0	4.2	2.7
Haverhill	84.8	38.9	38.9	56	31.3	4.8	4.2	2.4	3.1
Lawrence	72.2	77.1	70.2	193	56.8	5.8	3.6	3.6	2.6
Lowell	83.1	58.4	56.6	184	44.7	8.9	5.8	7.2	4.4
Lynn	85.4	67.0	57.4	149	46.2	4.9	3.1	2.8	2.0
Malden	84.5	40.7	27.5	17	11.0	4.3	3.1	2.2	2.4
Medford	86.0	23.3	19.0	14	8.3	4.1	2.4	4.1	1.9
Methuen	81.6	36.5	37.4	26	16.0	1.8	2.3	.	1.2
New Bedford	76.4	55.4	64.0	144	47.4	1.6	3.5	1.6	3.0
Newton	89.0	8.3	8.5	7	1.7	2.5	1.6	2.5	1.6
Peabody	90.6	31.1	31.3	17	12.1	2.0	1.3	2.0	0.7
Pittsfield	70.5	54.7	56.7	46	34.4	11.8	6.5	7.8	3.9
Plymouth	90.5	30.6	29.8	26	15.8	1.8	1.1	1.8	0.5
Quincy	90.3	34.2	25.7	31	15.6	3.3	3.2	3.3	2.9
Revere	84.8	53.2	38.7	37	25.8	2.7	2.2	2.7	1.8
Somerville	89.0	31.6	26.8	30	17.5	2.1	2.1	2.1	1.4
Springfield	71.8	75.6	71.4	371	54.3	9.2	6.7	4.0	4.5
Taunton	78.4	30.7	46.1	49	28.1	2.9	5.1	2.9	1.9
Waltham	82.2	30.7	23.9	17	7.2	2.5	1.6	2.5	1.2
Weymouth	92.9	27.0	25.6	14	9.7	3.2	1.6	1.6	1.0
Worcester	72.0	51.1	52.5	244	31.6	5.7	5.6	5.2	4.5

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. The 30 largest municipalities are the cities/ towns in Massachusetts with the largest populations (See Technical Notes). 2. Crude birth rates represent the number of births per 1,000 residents (male and female). 3. For the category of Mother's Race and Ethnicity, percentages are calculated based on the state total of resident births, including births for which mother's race/Hispanic ethnicity is unknown. 4. Mothers who designated themselves as Asian, American Indian, or Other. 5. Calculations based on 1-4 events are excluded. 6. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 7. Public payment sources include CommonHealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care. 8. Births per 1,000 female residents ages 15-19; rates for cities and towns were calculated using MDPH population estimates for 2010. 9. Deaths per 1,000 live births. See Definitions of Rates section in the Glossary for definitions of infant and neonatal mortality rates.

Table 13. Birth Characteristics by Licensed Maternity Facility, Massachusetts: 2010

Facility[1]	Location	(2) Occurrence Births (n)	(3) Low Birth weight (%)	(4) Public Pay for PNC (%)	(5) Adequate Prenatal Care (%)	Cesarean Deliveries (%)	(6) Early Term (%)	(7) Late preterm (%)
State Total		**73,275**	**7.7**	**35.4**	**84.9**	**33.4**	**21.1**	**5.9**
Anna Jaques Hospital	Newburyport	647	3.2	34.6	87.2	29.1	15.0	5.4
Baystate Franklin Medical Center	Greenfield	465	3.7	54.4	84.9	20.9	18.5	4.1
Baystate Mary Lane Hospital	Ware	109	--[8]	53.2	88.1	34.9	10.1	12.8
Baystate Medical Center	Springfield	4,090	12.1	53.5	76.7	33.9	22.5	9.5
Berkshire Medical Center	Pittsfield	667	5.8	49.3	65.5	32.5	21.0	6.7
Beth Israel Deaconess Medical Center	Boston	4,667	12.1	20.8	88.4	38.0	22.2	8.1
Beverly Hospital	Beverly	2,024	4.7	36.1	91.7	30.5	23.4	5.1
Boston Medical Center	Boston	2,362	10.1	74.4	70.6	30.1	24.4	6.8
Brigham And Women's Hospital	Boston	7,884	11.1	23.2	94.8	34.3	16.5	6.9
Brockton Hospital	Brockton	972	6.1	60.6	83.1	41.8	25.6	7.4
Cambridge Birth Center	Cambridge	119	--[8]	8.4	72.3	--[8]	16.8	--[8]
Cambridge Hospital	Cambridge	1,205	3.7	65.0	82.7	26.1	22.5	1.1
Cape Cod Hospital	Barnstable	862	4.6	51.4	81.9	30.4	15.5	3.6
Caritas Good Samaritan Medical Center	Brockton	916	5.7	60.9	66.8	40.1	25.0	6.7
Caritas Holy Family Hospital and Medical Center	Methuen	967	5.3	42.1	79.9	42.0	21.5	5.5
Caritas Norwood Hospital	Norwood	479	4.8	25.7	58.0	37.0	25.5	4.6
Caritas St. Elizabeth's Medical Center Of Boston	Boston	1,024	12.8	28.9	57.8	36.0	27.1	8.6
Charlton Memorial Hospital	Fall River	1,560	5.6	57.4	87.0	35.8	18.6	4.1
Cooley Dickinson Hospital	Northampton	863	2.8	28.6	91.8	29.4	14.5	3.2
Emerson Hospital	Concord	1,129	5.0	7.7	89.7	31.4	26.3	4.3
Fairview Hospital	Great Barrington	172	--[8]	56.7	82.6	40.1	23.8	--[8]
Falmouth Hospital	Falmouth	538	3.9	41.9	89.2	37.2	24.4	4.5
Harrington Memorial Hospital	Southbridge	301	3.0	54.7	87.7	35.9	17.3	2.0
HealthAlliance Hospital	Leominster	1,012	3.2	51.4	84.1	27.0	17.6	4.7
Heywood Memorial Hospital	Gardner	478	3.6	45.7	80.6	21.3	21.1	2.9
Holyoke Hospital	Holyoke	521	6.1	69.9	60.3	22.1	10.7	1.0
Jordan Hospital	Plymouth	559	3.0	31.7	87.3	32.4	19.9	3.2
Lawrence General Hospital	Lawrence	1,529	4.3	68.2	74.5	32.4	24.3	4.3
Lowell General Hospital	Lowell	2,394	6.3	48.5	85.7	34.9	24.2	4.7
Martha's Vineyard Hospital	Oak Bluffs	125	--[8]	48.8	94.4	28.8	26.4	--[8]
Massachusetts General Hospital	Boston	3,491	9.5	26.0	88.8	29.2	21.0	5.6
Melrose-Wakefield Hospital	Melrose	1,145	5.1	29.1	89.6	43.1	23.7	6.2
Mercy Medical Center	Springfield	1,215	3.8	58.5	84.0	26.7	24.3	4.4
Metrowest Medical Center-Framingham Union Campus	Framingham	1,427	6.6	44.6	94.2	39.9	21.0	6.9
Milford Regional Medical Center	Milford	991	4.7	29.4	94.4	35.0	22.2	5.6

Table 13. Birth Characteristics by Licensed Maternity Facility, Massachusetts: 2010

Facility[1]	Location	(2) Occurrence Births (n)	(3) Low Birth weight (%)	(4) Public Pay for PNC (%)	(5) Adequate Prenatal Care (%)	Cesarean Deliveries (%)	(6) Early Term (%)	(7) Late preterm (%)
Morton Hospital	Taunton	514	5.8	23.1	71.0	35.2	23.9	7.8
Mount Auburn Hospital	Cambridge	2,260	3.8	18.7	88.3	25.6	15.8	4.5
Nantucket Cottage Hospital	Nantucket	111	--[8]	42.7	81.7	27.0	19.8	--[8]
Newton Wellesley Hospital	Newton	3,692	5.1	3.0	91.1	34.2	23.1	5.0
North Adams Regional Hospital	North Adams	289	3.5	53.8	90.0	25.6	24.2	5.9
North Shore Birth Center	Beverly	106	--[8]	16.0	93.3	--[8]	20.8	--[8]
North Shore Medical Center - Salem Hospital	Salem	1,480	6.2	52.8	88.1	32.6	22.8	5.7
Saint Vincent Hospital	Worcester	1,921	4.5	28.0	86.1	28.9	23.4	5.2
South Shore Hospital	Weymouth	3,737	7.0	20.0	95.9	42.9	19.5	5.1
St. Luke's Hospital	New Bedford	1,403	7.2	50.3	74.6	36.7	25.3	6.9
Sturdy Memorial Hospital	Attleboro	910	4.0	16.9	84.9	37.7	18.2	3.0
Tobey Hospital	Wareham	462	4.1	41.8	86.1	24.7	18.8	2.2
Tufts Medical Center	Boston	1,161	27.8	47.7	90.9	38.9	23.9	13.2
UMass Memorial Medical Center - West Campus	Worcester	3,913	11.8	38.0	70.9	29.4	18.9	6.7
Winchester Hospital	Winchester	2,048	5.5	5.9	88.0	37.2	22.0	6.5
Other Hospitals		4	--[8]	--[8]	--[8]	--[8]	--[8]	--[8]
Home, Enroute & Dr. Off.		355	5.2	21.5	67.5	--[8]	16.7	3.7

NOTE: All percentages are calculated based on only those occurrence births with known values for the characteristic(s) of interest.

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definition of occurrence births. 3. Less than 2,500 grams (5.5 lbs.) 4. Public payment for prenatal care (PNC) includes Medicaid/MassHealth, CommonHealth, Medicare, Healthy Start, other government programs, and free care. 5. Based on the APNCU Index. 6. Birth at 37 or 38 week of gestation. 7. Birth at 34 to 36 weeks of gestation. 8. Calculations based on 1-4 events are excluded.

Table 14. Comparison of Massachusetts Perinatal Health Indicators with Healthy People 2020 Objectives, Massachusetts: 2007-2010

Healthy People 2020 Objectives[1] (Focus Area: Maternal, Infant and Child Health MICH[2])	HP2020 Target	Massachusetts 2007	2008	2009	2010	Has Massachusetts achieved HP2020 target? ✓ = YES O = NO, but within 25% of target ● = NO, > 25% from target
Fetal, Infant, and Maternal Deaths						
MICH-1.1. Fetal Mortality Rate[3]	5.6	5.1	5.0	5.0	4.5	√
MICH-1.2. Perinatal Mortality Rate[4]	5.9	5.2	5.6	5.5	4.9	√
MICH-1.3. Infant Mortality Rate[5]	6.0	4.9	5.0	4.8	4.4	√
MICH-1.4. Neonatal Mortality Rate[6]	4.1	3.4	3.8	3.7	3.3	√
MICH-1.5. Postneonatal Mortality Rate[7]	2.0	1.5	1.2	1.2	1.1	√
MICH-5. Maternal Mortality Ratio[8]	11.4	8.9	10.3	4.0	5.5	√
Risk Factors						
MICH-8.1. Low Birthweight[9] (%)	7.8	7.9	7.8	7.8	7.8	√
MICH-8.2. Very Low Birthweight[10] (%)	1.4	1.4	1.3	1.4	1.3	√
MICH-9.1. Preterm[11] (%)	11.4	11.2	10.8	10.9	10.7	√
Prenatal Care						
MICH-10.1. Care beginning in first trimester (%)	77.9	82.0	81.0	82.6	83.9	√
MICH-10.2. Early and adequate care[12] (%)	77.6	82.8	82.1	84.3	84.9	√
Obstetrical Care						
MICH-33. Very Low Birthweight[10] Infants born at Level III Hospitals[13] (%)	82.5	81.1	76.2	81.1	82.5	√
MICH-7.1. Cesarean Sections: Low-Risk[14] Women Giving Birth for the First Time (%)	23.9	29.3	29.6	28.3	27.6	O
MICH-7.2. Cesarean Sections: Low-Risk[14] Women with Prior Cesarean Section (%)	81.7	91.1	91.1	90.4	89.7	O
Breastfeeding						
MICH-21.1. Breastfeeding[15] (%)	81.9	79.2	80.8	82.0	82.9	√
Prenatal Substance Exposure						
MICH-11.3. Abstinence from Smoking[15] (%)	98.6	92.5	93.1	93.2	93.7	O

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. National health promotion and disease prevention agenda established by the US Dept. of Health and Human Services. 2. Goal: to improve the health and well-being of women, infants, children, and families. 3. Number of fetal deaths per 1,000 fetal deaths plus live births. 4. Number of fetal and infant deaths in perinatal period (from 28 weeks gestation (inclusive) to 6 days (inclusive) after birth per 1,000 fetal deaths plus live births. 5. Number of infant deaths (under one year of age) per 1,000 live births. 6. Number of deaths to infants less than 28 days of age per 1,000 live births. 7. Number of deaths to infants 28-364 days of age per 1,000 live births. 8. See Definition of Rates section in Technical Notes. 9. Less than 2,500 grams, or 5.5 pounds. 10. Less than 1,500 grams, or 3.3 pounds. 11. Born before completion of 37th week of gestation. Note that beginning with this report, this indicator has been changed to reflect the NCHS method of calculating preterm using LMP. The values do not match previously published values as well as preterm values published elsewhere in this report. See entry for Gestational Age in the Glossary for further explanation. 12. Based on Adequacy of Prenatal Care Utilization Index (see Glossary). 13. Facilities for high-risk deliveries and neonates that can provide care to very small infants, including mechanical ventilation and neonatal surgery and special care for transferred patients and for which a full-time neonatologist serves as the director. 14. "Low-risk"= full term birth, singleton, vertex presentation. 15. HP2020 specifies objective as mother 'ever' breastfeeding. Massachusetts data is based on mother's self-report of current breastfeeding or intention to breastfeed, and of smoking during pregnancy.

Appendix:

Additional Tables & Figures

Technical Notes

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Table 15. Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2010

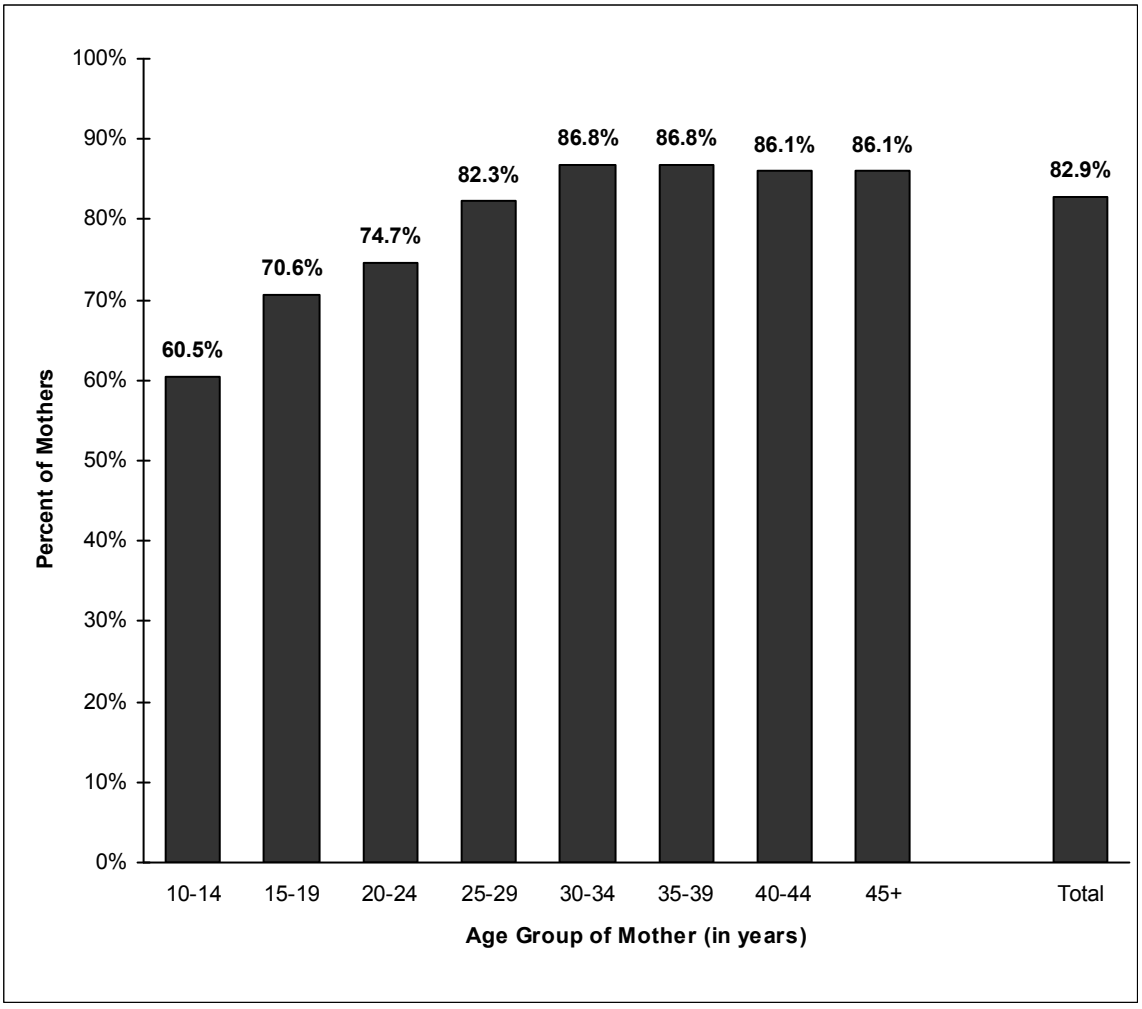
CHNA[1]	Population	Crude Birth Rate[2]	Mother's Race and Ethnicity: White non-Hispanic % [4]	Black non-Hispanic % [4]	Hispanic % [4]	Asian and Other[3] % [4]	Very Low BWT (<1500 g) %	Low BWT (<2500) %	GDM %
STATE TOTAL	**6,547,629**	**11.1**	**66.5**	**9.3**	**14.5**	**9.5**	**1.3**	**7.8**	**4.7**
Community Health Network of Berkshire County	131,201	8.9	86.8	4.2	5.3	3.7	1.4	7.6	3.6
Upper Valley Health Web	87,103	9.2	90.8	1.1	4.8	2.0	0.6	5.4	3.6
Partnership for Health in Hampshire County	155,868	7.3	81.9	2.8	6.8	8.3	1.2	7.6	5.2
The Community Health Connection	296,824	12.0	45.9	14.0	35.9	4.1	1.4	9.0	5.9
South County Connects	119,521	9.9	88.6	1.4	8.1	1.7	0.8	7.4	5.2
Community Partners for Health	166,801	10.6	89.1	1.5	5.0	4.4	1.0	6.2	3.2
Community Health Coalition of Metro West	388,833	11.1	78.1	2.8	7.7	11.3	1.2	8.2	5.0
Common Pathways	308,987	12.0	68.5	11.2	11.7	8.6	1.5	7.7	5.0
CHN of North Central Massachusetts	262,605	10.3	80.7	3.3	11.9	3.9	1.7	8.2	5.2
The Greater Lowell CHNA	275,380	12.2	61.7	5.8	12.3	20.2	1.8	8.2	7.1
The Greater Lawrence CHNA	194,135	13.0	39.3	2.5	52.3	5.8	1.0	6.5	3.6
The Greater Haverhill CHNA	148,555	10.4	83.6	2.3	11.2	2.9	1.2	7.3	5.3
The North Shore CHN (Beverly/Gloucester Area)	115,774	8.8	88.9	1.0	4.7	5.3	0.7	5.1	5.9
The North Shore CHN (Salem/Lynn Area)	284,624	11.5	57.3	6.7	27.4	8.6	1.2	7.6	4.5
Northwest Suburban Health Alliance	215,708	9.9	72.5	5.2	3.6	18.7	1.4	7.8	4.3
North Suburban Health Alliance	270,246	13.1	63.7	11.2	9.0	16.0	1.1	7.9	4.7
The Greater Cambridge/Somerville CHNA	280,370	12.7	66.1	8.0	7.4	18.4	1.0	7.1	4.1
West Suburban Health Network	258,814	9.9	69.9	4.6	10.0	15.4	0.9	6.7	3.9
Boston Alliance for Community Health	780,727	12.9	42.4	22.7	24.2	10.5	1.5	9.0	4.0
Blue Hills Community Health Alliance	377,231	10.9	68.6	10.0	3.4	17.7	1.4	6.8	4.9
CHN of Holyoke, Chicopee, Ludlow, Westfield	160,875	11.3	60.7	3.2	33.2	2.6	1.4	7.2	5.2
The Greater Brockton CHNA	236,733	12.1	58.9	28.7	7.6	4.6	1.9	8.7	5.0
South Shore CHN	190,525	9.5	93.7	1.8	1.8	2.3	1.2	7.3	3.9
The Greater Attleboro-Taunton CHNA	256,275	10.5	84.7	4.9	4.7	5.6	1.2	8.0	3.3
Partners for Healthier Communities	138,403	11.0	83.4	4.4	8.4	3.6	1.4	8.5	6.9
Greater New Bedford CHN	202,130	10.4	72.8	9.1	15.2	2.9	1.1	7.2	5.1
Cape and Islands Health Network	242,523	8.3	85.6	5.1	4.2	5.0	1.3	7.0	2.8

Table 15 (cont'd). Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2010

CHNA[1]	Births					Deaths			
	Adequate Prenatal Care[6]	Public Payment[7] for Prenatal Care	Unmarried	Teen Mothers 15 to 19 years		Infant Mortality Rate[9]		Neonatal Mortality Rate[9]	
	%	%	%	n	Rate[8]	2010	2008- 2010	2010	2008-2010
STATE TOTAL	**84.9**	**35.8**	**34.6**	**3,907**	**17.1**	**4.4**	**4.7**	**3.3**	**3.6**
Community Health Network of Berkshire County	75.0	51.1	49.5	95	20.6	6.8	4.3	5.1	2.6
Upper Valley Health Web	85.2	46.6	42.5	51	19.8	6.3	4.6	--[5]	2.5
Partnership for Health in Hampshire County	87.6	28.5	28.6	30	3.2	5.2	3.5		2.3
The Community Health Connection	75.7	61.3	55.7	426	36.7	7.0	5.2	3.4	3.5
South County Connects	80.6	33.6	38.3	90	22.8	5.0	3.4	--[5]	2.1
Community Partners for Health	90.2	23.9	24.5	54	9.3	2.8	1.3	--[5]	0.9
Community Health Coalition of Metro West	89.0	20.3	17.6	105	8.5	3.0	2.3	2.5	2.1
Common Pathways	75.0	38.7	41.3	272	22.8	7.6	5.3	6.8	4.4
CHN of North Central Massachusetts	84.2	35.1	37.5	175	18.6	8.5	4.0	6.3	3.0
The Greater Lowell CHNA	86.2	37.1	38.5	222	23.3	7.4	4.0	6.2	3.1
The Greater Lawrence CHNA	78.4	52.6	49.8	234	30.8	4.8	3.0	2.8	2.1
The Greater Haverhill CHNA	86.8	30.4	31.9	74	16.3	4.5	3.2	2.6	2.4
The North Shore CHN (Beverly/Gloucester Area)	91.8	28.5	22.7	27	6.5	--[5]	2.2	--[5]	1.2
The North Shore CHN (Salem/Lynn Area)	88.7	44.7	41.4	208	22.7	3.1	2.1	--[5]	--[5]
Northwest Suburban Health Alliance	88.7	10.8	13.6	25	3.7	3.3	2.0	2.3	1.7
North Suburban Health Alliance	86.6	30.0	23.5	76	10.1	2.8	2.1	1.7	1.5
The Greater Cambridge/Somerville CHNA	88.2	17.9	15.6	53	7.2	3.1	2.0	2.8	1.5
West Suburban Health Network	87.5	15.7	13.5	29	2.6	3.5	1.8	2.7	1.4
Boston Alliance for Community Health	85.9	42.8	40.9	613	20.1	3.5	3.4	3.2	2.6
Blue Hills Community Health Alliance	89.4	24.0	21.5	73	6.9	2.7	2.7	2.4	2.3
CHN of Holyoke, Chicopee, Ludlow, Westfield	77.5	56.9	53.1	210	35.1	3.9	2.4	2.8	1.7
The Greater Brockton CHNA	82.7	42.2	40.8	161	17.8	5.2	4.0	3.8	3.3
South Shore CHN	91.9	23.2	23.8	54	9.0	3.3	1.9	3.3	1.6
The Greater Attleboro-Taunton CHNA	84.4	23.3	33.7	125	14.5	4.1	2.9	3.0	1.7
Partners for Healthier Communities	86.4	64.2	55.5	138	32.6	4.0	3.2	4.0	2.5
Greater New Bedford CHN	80.1	46.5	53.8	189	27.3	2.9	3.9	--[5]	3.0
Cape and Islands Health Network	86.1	43.6	35.7	98	15.8	4.5	3.0	3.5	2.4

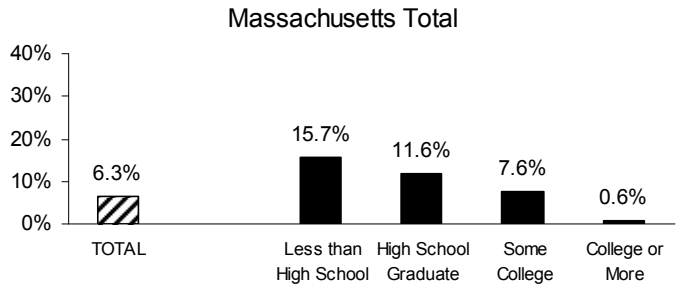
NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. Please see TableA1 for cities/ towns by CHNA. 2. Crude birth rates represent the number of births per 1,000 residents (male and female). 3. For the category of Mother's Race and Ethnicity, percentages are calculated based on the state total of resident births, including births for which mother's race/Hispanic ethnicity is unknown. 4. Mothers who designated themselves as Asian, American Indian, or Other. 5. Calculations based on 1-4 events are excluded. 6. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 7. Public payment sources include CommonHealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care. 8. Births per 1,000 female residents ages 15-19; rates for cities and towns were calculated using MDPH population estimates for 2010. 9. Deaths per 1,000 live births. See Definitions of Rates section in the Glossary for definitions of infant and neonatal mortality rates.

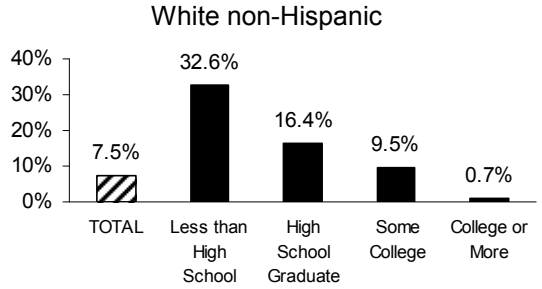
Figure 9. Percent of Mothers Breastfeeding or Intending to Breastfeed by Age Group, Massachusetts: 2010

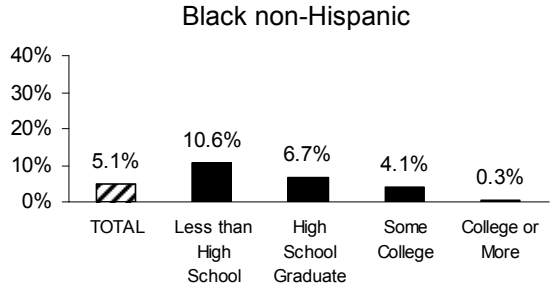


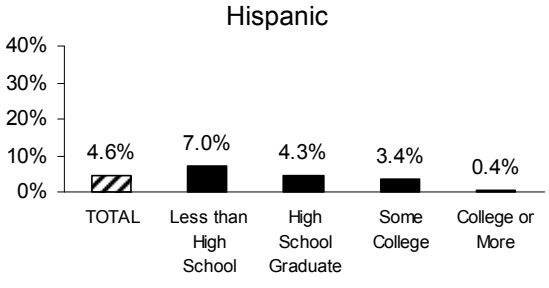
NOTE: Information about breastfeeding is reported by the mother at the time of the birth. For race-specific breastfeeding rates see Table 2.

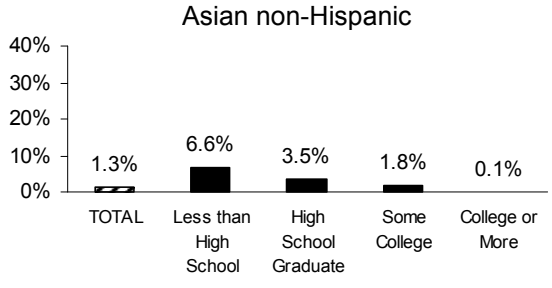
Figure 10. Percent of Mothers who Reported Smoking during Pregnancy by Mother's Race/Hispanic Ethnicity and Educational Attainment, Massachusetts: 2010





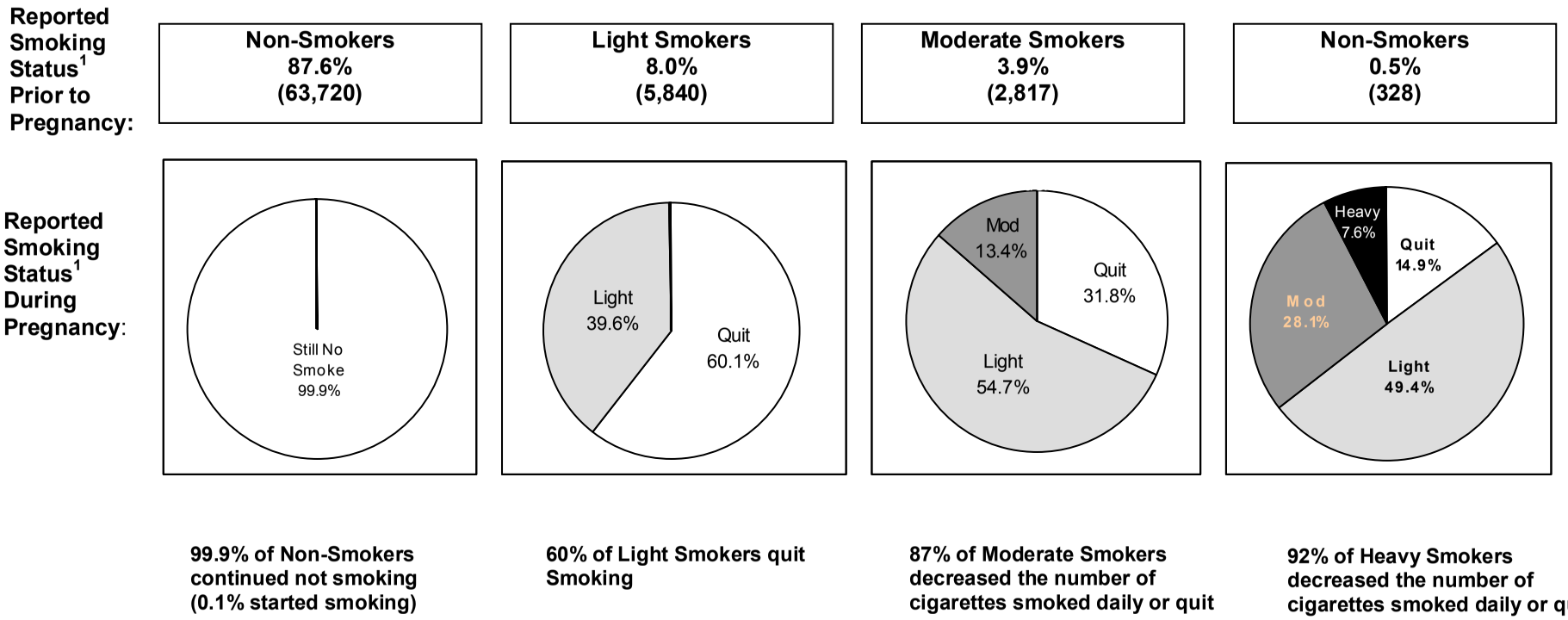






NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Smoking information is provided on the birth certificate as reported by the mother. Because smoking is self-reported, data on smoking prevalence should be interpreted cautiously. Asian data should be interpreted with caution because of small numbers.

Figure 11. Distribution of Reported Smoking Status during Pregnancy by Smoking Status Prior to Pregnancy, Massachusetts: 2010



1. Light Smokers=1-10 cigarettes daily; Moderate Smokers=11-20 cigarettes daily; Heavy Smokers=21 cigarettes or more daily.

Table 16. Parity by Age of Mother, Massachusetts: 2010

Age of Mother (years)		Total Births	Parity[1]				
			1st	2nd	3rd	4th	5th+
State Total	**N[2]**	**72,835**	**33,050**	**25,250**	**9,648**	**3,035**	**1,607**
	%[3]	100.0	45.5	34.8	13.3	4.2	2.2
10-14	**N[2]**	39	39	0	0	0	0
	%[3]	100.0	100.0	--[4]	--[4]	--[4]	--[4]
15-19	**N[2]**	3,907	3,383	453	56	4	1
	%[3]	100.0	86.8	11.6	1.4	--[4]	--[4]
20-24	**N[2]**	11,298	6,704	3,355	966	189	52
	%[3]	100.0	59.5	29.8	8.6	1.7	0.5
25-29	**N[2]**	18,043	8,866	5,886	2,236	681	320
	%[3]	100.0	49.3	32.7	12.4	3.8	1.8
30-34	**N[2]**	23,158	9,342	8,971	3,265	983	516
	%[3]	100.0	40.5	38.9	14.1	4.3	2.2
35-39	**N[2]**	13,020	3,732	5,369	2,487	895	487
	%[3]	100.0	28.8	41.4	19.2	6.9	3.8
40-44	**N[2]**	3,160	905	1,150	601	271	215
	%[3]	100.0	28.8	36.6	19.1	8.6	6.8
45+	**N[2]**	205	76	65	36	12	16
	%[3]	100.0	37.1	31.7	17.6	5.9	7.8

1. The number of live births including this birth. 2. State totals include births of unknown parity and unknown mother's age.
3. Percents may not sum to 100.0 due to rounding. 4. Calculations based on values of 1-4 are excluded.

Table 17. Selected Birth Characteristics by Maternal Education, Massachusetts: 2010

	Less than High School		High School Graduate		Some College		College Graduate		More than College	
	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]
State Total	**7,241**	**10.0**	**18,241**	**25.1**	**14,827**	**20.4**	**19,266**	**26.5**	**13,089**	**18.0**
Race										
White non-Hispanic	2,329	4.8	10,560	21.8	9,846	20.3	15,172	31.4	10,481	21.7
Black non-Hispanic	919	13.5	2,411	35.5	2,006	29.6	1,087	16.0	363	5.3
Hispanic	3,442	32.5	3,955	37.4	1,988	18.8	804	7.6	389	3.7
Asian	427	7.3	958	16.5	730	12.6	1,972	33.9	1,723	29.7
Age (years)										
20-29	3,649	12.5	10,422	35.6	7,845	26.8	5,263	18.0	2,103	7.2
30-39	1,551	4.3	5,541	15.4	6,110	16.9	12,834	35.6	10,059	27.9
40+	140	4.2	567	16.9	557	16.6	1,158	34.6	925	27.6
Non-US-born[2]	3,084	42.6	5,553	30.4	3,389	22.9	4,644	24.1	3,240	24.8
Unmarried	5,473	75.6	10,753	59.0	6,388	43.1	1,978	10.3	582	4.4
Publicly-financed prenatal care	6,078	85.1	11,319	62.8	5,873	40.3	1,900	10.0	471	3.7
Very low birthweight[3]	124	1.7	283	1.6	208	1.4	196	1.0	133	1.0
Low birthweight[4]	674	9.3	1,579	8.7	1,125	7.6	1,348	7.0	889	6.8
Adequate prenatal care[5]	5,216	73.2	14,461	80.5	12,441	85.5	16,964	89.5	11,611	90.0
Cesarean delivery	1,883	26.0	5,866	32.2	5,048	34.1	6,896	35.8	4,494	34.4
Breastfeeding[6]	5,092	70.9	13,271	73.4	11,887	81.3	17,169	90.3	12,115	93.9
Multiple births	170	2.3	612	3.4	572	3.9	1,145	5.9	816	6.2
Smoking during pregnancy	1,137	15.7	2,122	11.6	1,119	7.6	166	0.9	32	0.2

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

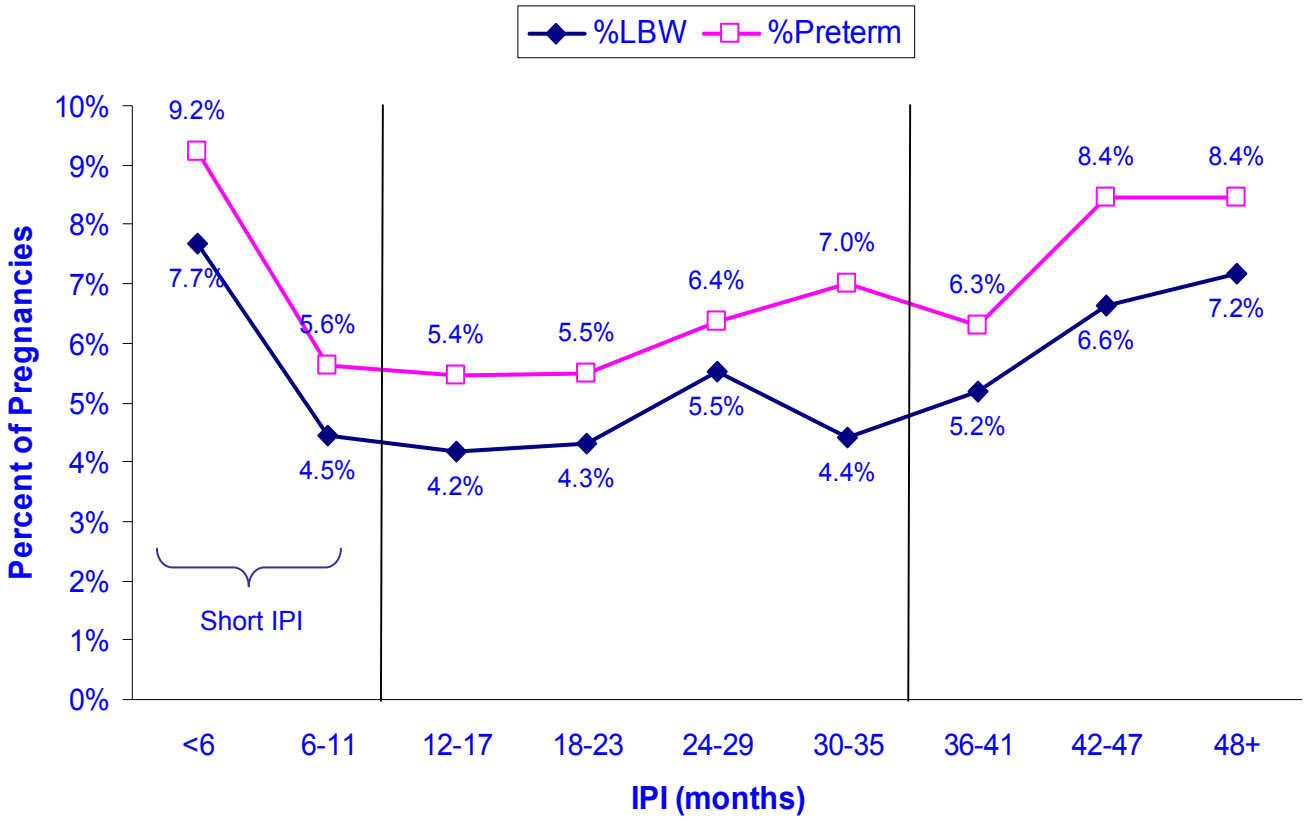
1. For state total, race and age categories, percentages are based on row totals. For all other categories, percentages are based on state column totals. 2. Includes women born outside of the 50 US States, Washington D.C., and Puerto Rico/US territories (the US Virgin Islands, and Guam). 3. Very low birthweight: less than 1,500 grams or 3.3 pounds. 4. Low birthweight: less than 2,500 grams or 5.5 pounds. 5. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 6. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

Table 18. Inter-pregnancy Interval (IPI) and Birth Outcomes -- Pregnancies to Multiparous Mothers, Massachusetts: 2010

	IPI[1] (months)	Pregnancies to Multiparous[2] Mothers	Birth Weight (BW)				Gestational Age (GA)			
			Low (<2,500 g)		Very Low (<1,500 g)		Preterm[3] (<37 wk)		Very Early[4] (<28 wk)	
			n	%LBW	n	%VLBW	n	%Preterm	n	%VEGA
	State Total	**37,708**	**2,087**	**5.5%**	**320**	**0.8%**	**2,592**	**6.9%**	**142**	**0.4%**
	<6	1,562	120	7.7%	17	1.1%	144	9.2%	8	0.5%
	6-11	3,998	178	4.5%	28	0.7%	225	5.6%	14	0.4%
	12-17	5,566	233	4.2%	26	0.5%	303	5.4%	10	0.2%
	18-23	4,949	213	4.3%	32	0.6%	272	5.5%	15	0.3%
	24-29	3,986	220	5.5%	27	0.7%	254	6.4%	14	0.4%
	30-35	3,176	140	4.4%	19	0.6%	222	7.0%	7	0.2%
	36-41	2,300	119	5.2%	19	0.8%	145	6.3%	7	0.3%
	42-47	1,897	126	6.6%	26	1.4%	160	8.4%	10	0.5%
	48+	10,274	738	7.2%	126	1.2%	867	8.4%	57	0.6%
Short	**0-11**	5,560	298	5.4%	45	0.7%	369	23.6%	22	1.4%
	12-35	17,678	806	4.6%	104	0.6%	1,052	67.3%	46	2.9%
	36+	14,471	983	6.8%	171	1.2%	1,172	75.0%	74	4.7%

1. Interpregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Multiparous is defined as having given birth two or more times. 3. Also known as premature delivery. 4. Very early gestational age (VEGA) refers to birth before 28 weeks of gestational age and is also known as *extremely preterm* delivery.

Figure 12. Inter-pregnancy Interval (IPI) by Selected Birth Outcomes: LBW and Preterm -- Pregnancies to Multiparous Mothers, Massachusetts: 2010



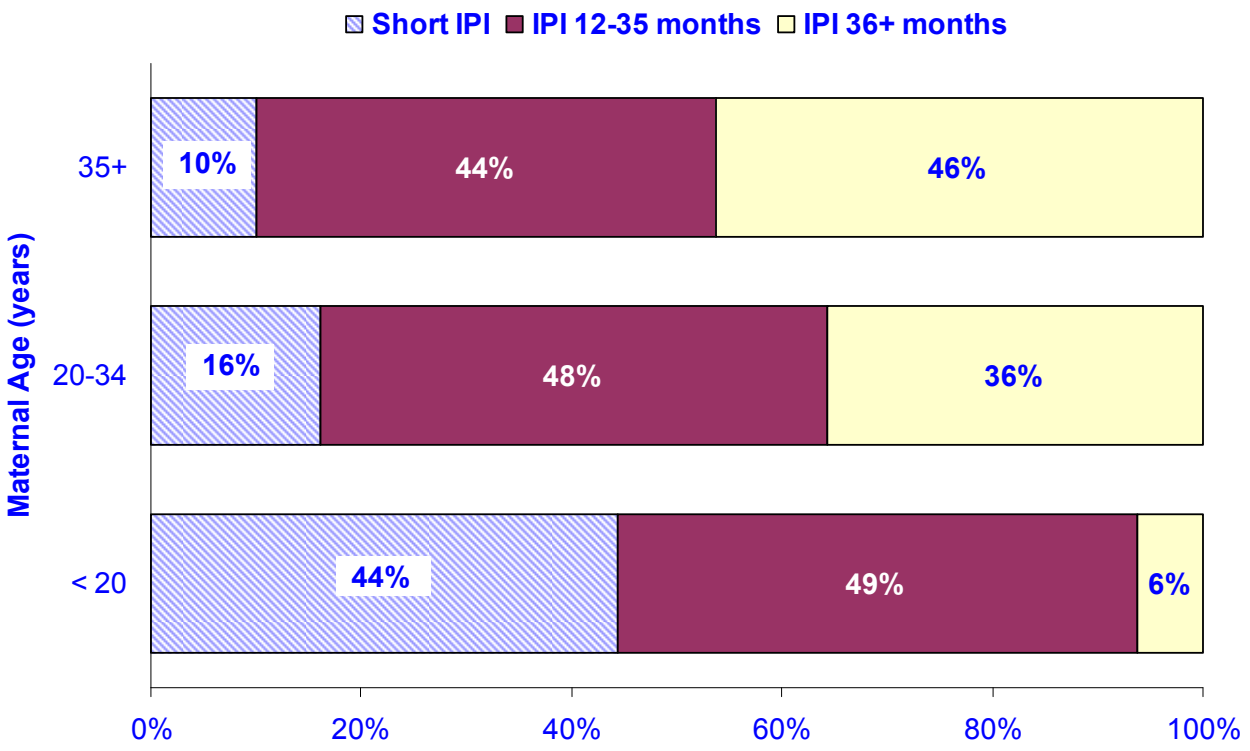
NOTE: Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. Short IPIs (less than 12 months) and IPIs over 35 months were associated with higher proportions of low birthweight (less than 2,500 grams or 5.5 pounds) and premature deliveries (gestational age less than 37 weeks).

Table 19. Inter-pregnancy Interval (IPI) by Maternal Characteristics -- Pregnancies to Multiparous Mothers, Massachusetts: 2010

	Total Pregnancies Parity >1		IPI[1] Short < 12 months		12-35 months		36+ months	
	n	%	n	%	n	%	n	%
State Total[2]	**37,708**	**100%**	**5,560**	**14.7%**	**17,677**	**46.9%**	**14,471**	**38.4%**
Age								
< 20	477	1.3%	212	44.4%		49.3%	30	6.3%
20-34	26,280	69.7%	4,255	16.2%	12,653	48.1%	9,372	35.7%
35+	10,951	29.0%	1,093	10.0%	4,789	43.7%	5,069	46.3%
Race Ethnicity								
White non-Hispanic	24,419	64.8%	3,778	15.5%	12,740	52.2%	7,901	32.4%
Black non-Hispanic	3,841	10.2%	553	14.4%	1,313	34.2%	1,975	51.4%
Hispanic	6,146	16.3%	845	13.7%	2,141	34.8%	3,160	51.4%
Asian non-Hispanic	2,771	7.3%	306	11.0%	1,254	45.3%	1,211	43.7%
Education								
High School or less	14,171	37.6%	2,145	15.1%	5,225	36.9%	6,801	48.0%
BA or Assoc	17,421	46.2%	2,554	14.7%	8,655	49.7%	6,212	35.7%
More than college	6,064	16.1%	856	14.1%	3,767	62.1%	1,441	23.8%
Delivery Payment Source								
Public	14,650	38.9%	2,284	15.6%	5,392	36.8%	6,974	47.6%
Private	22,082	58.6%	3,136	14.2%	11,786	53.4%	7,160	32.4%
Region[3] of Residence								
Western MA	4,714	12.5%	749	15.9%	2,080	44.1%	1,885	40.0%
Central MA	5,144	13.6%	780	15.2%	2,463	47.9%	1,901	37.0%
Northeast MA	7,900	20.9%	1,161	14.7%	3,627	45.9%	3,112	39.4%
Metrowest MA	8,229	21.8%	1,102	13.4%	4,386	53.3%	2,741	33.3%
Southeast MA	6,906	18.3%	1,118	16.2%	3,118	45.1%	2,670	38.7%
Boston Region	4,815	12.8%	650	13.5%	2,003	41.6%	2,162	44.9%
Town of Residence[4]			**Top 10**		**Top 10**		**Top 10**	
			West Springfield (23.9%)		Natick (65.2%)		Chelsea (57.0%)	
			Fall River (19.7%)		Arlington (62.8%)		Everett (54.0%)	
			Fitchburg (19.1%)		Brookline (59.2%)		Brockton (51.7%)	
			Springfield (19.0%)		Newton (56.9%)		Lawrence (50.7%)	
			Westfield (18.4%)		Billerica (55.1%)		Lynn (48.9%)	
			Haverhill (17.8%)		Westfield (54.1%)		Marlborough (47.0%)	
			Methuen (17.5%)		Weymouth (52.3%)		Malden (46.4%)	
			New Bedford (17.4%)		Cambridge (51.9%)		Boston (45.1%)	
			Holyoke (17.0%)		Plymouth (47.6%)		Chicopee (44.9%)	
			Plymouth (16.8%)		Salem (47.5%)		Revere (44.5%)	

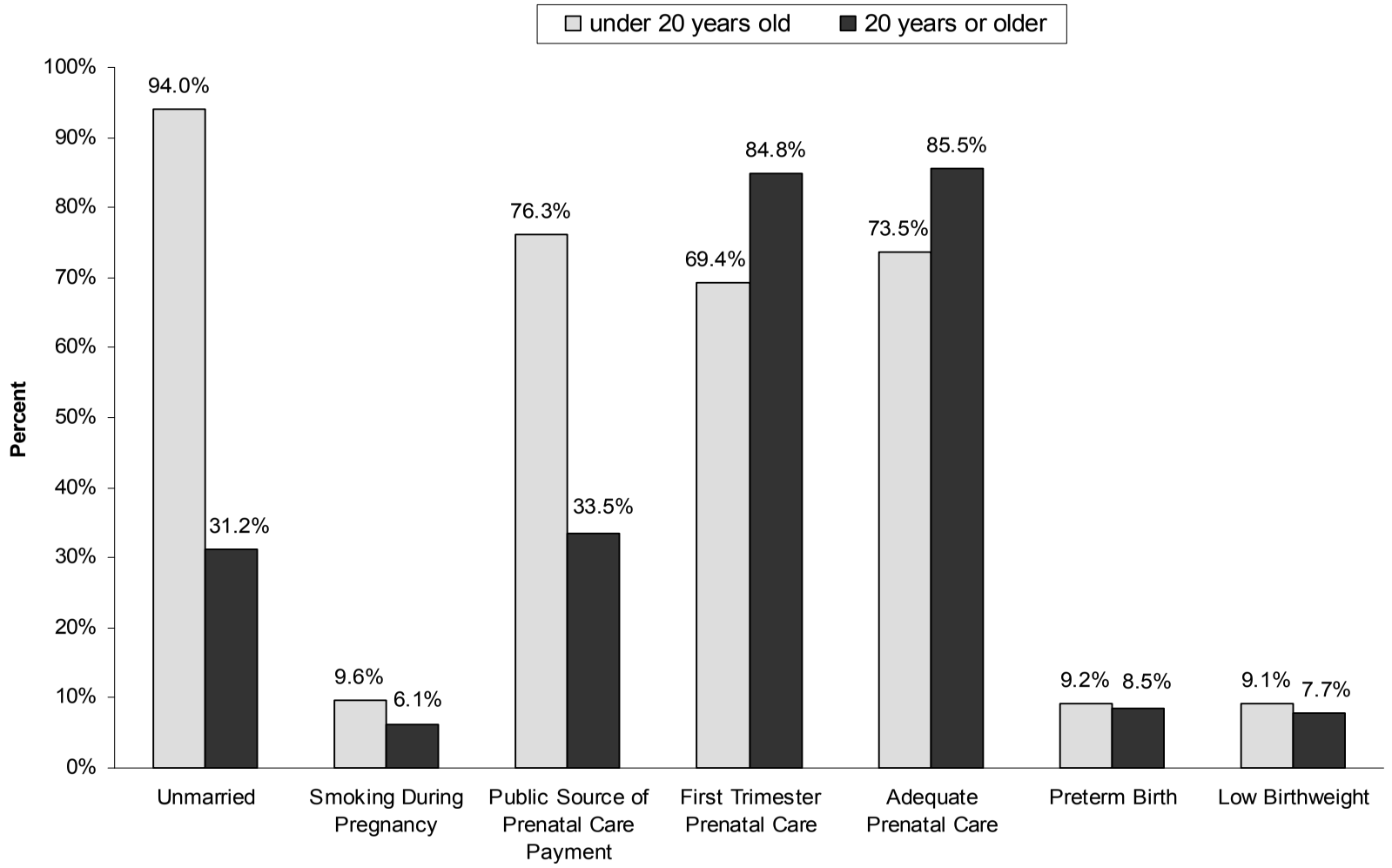
1. Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth among multiparous mothers, i.e. among those giving birth to their 2nd or later child. 2. State total includes pregnancies with known IPI. 3. Regions of the state defined by the Executive Office of Health and Human Services 4. Among towns with at least 200 mothers giving birth to their 2nd or later child.

Figure 13. Inter-pregnancy Interval (IPI) Distribution by Maternal Age -- Pregnancies to Multiparous Mothers, Massachusetts: 2010



NOTE: Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth among multiparous mothers, i.e. among those giving birth to their 2nd or later child.

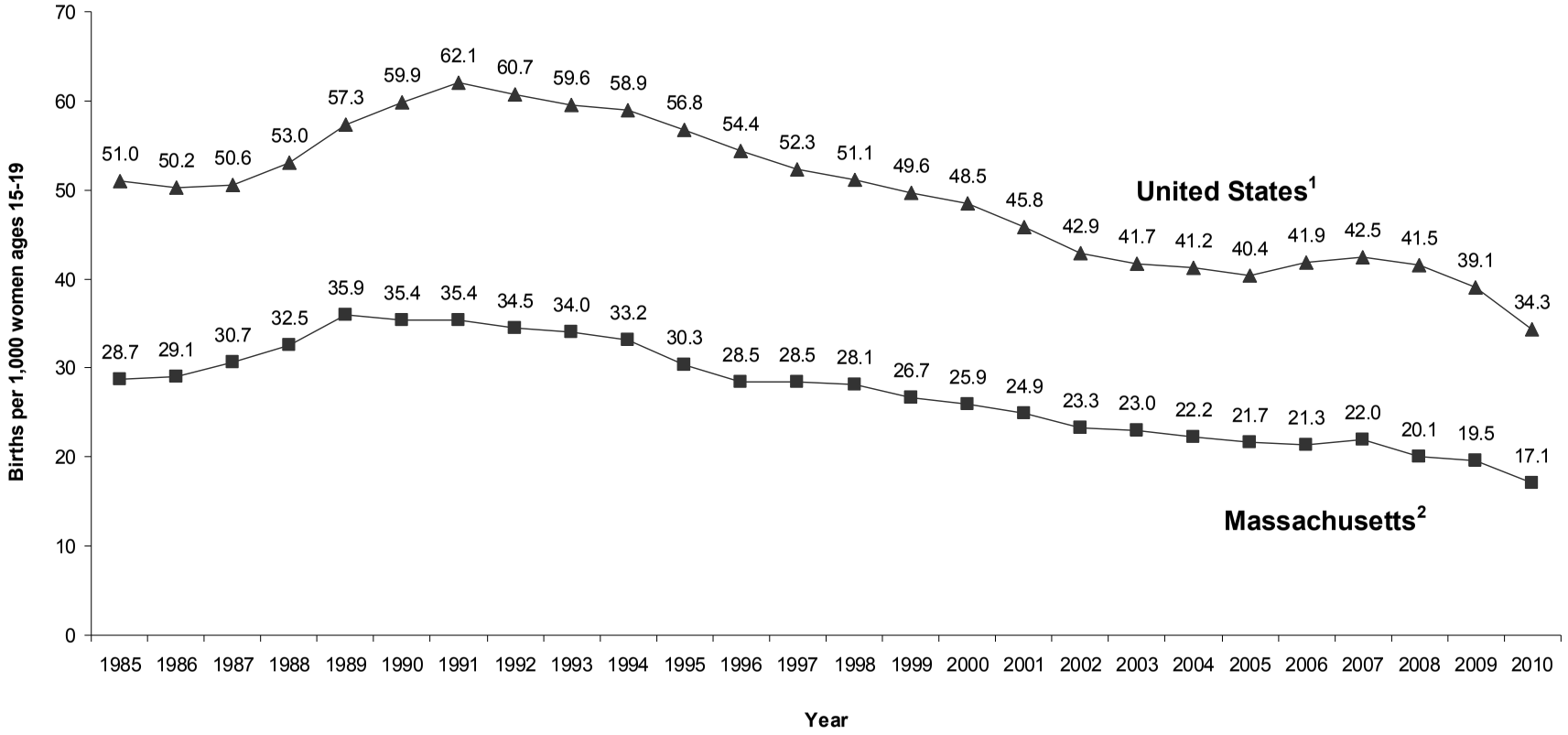
Figure 14. Comparison of Teen vs. Adult Births, Selected Characteristics, Massachusetts: 2010



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Three age groups are used for "teen births": 10-14, 15-19, and <20. The "10-14" group refers to young teens, and the "15-19" group is the age group referred to as teens by the Centers for Disease Control and Prevention. For this publication, "<20" is used when comparing young women with "adult" women.

Definitions: Adequate Prenatal Care = based on Adequacy of Prenatal Care Utilization (APNCU) Index. See Appendix (Glossary and Technical Notes) for more details on the APNCU Index. Preterm Birth = gestational age less than 37 weeks, based on clinical estimate of gestational age. Low Birthweight = less than 2,500 grams (5.5 lbs.).

Figure 15. Trend in Birth Rates among Females ages 15-19, Massachusetts and the United States: 1985-2010



Teen birth rate is the number of births to females ages 15-19 per 1,000 females ages 15-19

Data sources: 1) U.S. annual natality data (NCHS) and 1990 U.S. Census data (population data used in denominators); 2) Massachusetts: annual birth data files, decennial Census counts (1990) and intercensal population estimates based on MISER (Massachusetts Institute for Social and Economic Research) population estimates for 1991 through 1998. 1999 rates are calculated using the 1999 DPH Massachusetts population estimates and Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2000-2005, released October 2006. 2009 birth rates are based on the 2009 population estimates from the National Center for Health Statistics. PLEASE NOTE: DIFFERENCES BETWEEN THESE RATES AND PREVIOUSLY PUBLISHED DATA REFLECT UPDATES IN POPULATION ESTIMATES.

Table 20. Resident Teen Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2010

Municipality[1]	Total Population Rank	Female Population, ages 15-19	Number of Teen Births	Teen Birth Rate[2]	Mother's Race and Hispanic Ethnicity (% of teen births)			
					White non-Hispanic	Black non-Hispanic	Hispanic	Asian or other[3]
State Total		**227,876**	**3,907**	**17.1**	**43.1**	**13.3**	**38.7**	**4.8**
Arlington	30	867	4	--[4]	--[4]	--[4]	--[4]	--[4]
Attleboro	29	1,344	29	21.6	75.9	3.4	13.8	6.9
Barnstable	27	1,278	24	18.8	75.0	16.7	4.2	4.2
Boston	1	25,988	503	19.4	15.3	39.4	41.6	3.8
Brockton	7	3,354	119	35.5	27.7	52.1	16.8	3.4
Brookline	18	1,469	4	--[4]	--[4]	--[4]	--[4]	--[4]
Cambridge	5	3,550	15	4.2	26.7	46.7	20.0	6.7
Chicopee	22	1,881	52	27.6	32.7	1.9	59.6	5.8
Fall River	10	2,781	124	44.6	71.8	6.5	18.5	3.2
Framingham	14	2,351	52	22.1	34.6	11.5	50.0	3.8
Haverhill	15	1,791	56	31.3	46.4	3.6	44.6	5.4
Lawrence	12	3,395	193	56.8	9.3	1.0	88.1	1.6
Lowell	4	4,118	184	44.7	25.0	2.2	42.4	30.4
Lynn	9	3,223	149	46.2	16.8	10.1	61.7	11.4
Malden	17	1,548	17	11.0	41.2	11.8	29.4	17.6
Medford	20	1,683	14	8.3	42.9	50.0	0.0	7.1
Methuen	26	1,624	26	16.0	30.8	0.0	69.2	0.0
New Bedford	6	3,037	144	47.4	50.7	14.6	34.7	0.0
Newton	11	4,195	7	1.7	42.9	0.0	57.1	0.0
Peabody	25	1,405	17	12.1	76.5	5.9	17.6	0.0
Pittsfield	28	1,339	46	34.4	71.7	15.2	8.7	4.3
Plymouth	19	1,641	26	15.8	88.5	3.8	3.8	3.8
Quincy	8	1,984	31	15.6	61.3	22.6	6.5	9.7
Revere	24	1,434	37	25.8	29.7	2.7	62.2	5.4
Somerville	13	1,711	30	17.5	23.3	23.3	46.7	6.7
Springfield	3	6,836	371	54.3	8.4	17.5	72.8	1.3
Taunton	21	1,744	49	28.1	75.5	10.2	10.2	4.1
Waltham	16	2,356	17	7.2	11.8	11.8	76.5	0.0
Weymouth	23	1,444	14	9.7	92.9	0.0	0.0	7.1
Worcester	2	7,726	244	31.6	66.0	6.1	25.0	2.9

Table 20 (cont'd). Resident Teen Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2010

Municipality	Public Payment for Prenatal Care[5] (%)	Unmarried (%)	Low Birthweight[6] (%)	Preterm[7] (%)	Adequacy of Prenatal Care[8]			
					Adequate Intensive	Adequate Basic	Intermediate	Inadequate[9]
State Total	**76.2**	**94.0**	**9.0**	**9.2**	**33.9**	**39.9**	**8.9**	**17.3**
Arlington	50.0	75.0	0.0	0.0	0.0	25.0	0.0	75.0
Attleboro	58.3	89.7	6.9	13.8	67.9	17.9	3.6	10.7
Barnstable	62.5	79.2	8.3	12.5	41.7	25.0	16.7	16.7
Boston	77.6	94.6	10.0	8.6	21.2	58.4	8.7	11.7
Brockton	84.0	95.8	10.9	8.4	33.1	34.7	13.6	18.6
Brookline	50.0	100.0	0.0	0.0	0.0	50.0	0.0	50.0
Cambridge	66.7	93.3	13.3	6.7	46.7	40.0	0.0	13.3
Chicopee	88.5	94.2	5.8	7.7	40.4	36.5	7.7	15.4
Fall River	91.7	95.2	4.9	3.3	61.2	14.9	2.5	21.5
Framingham	86.5	88.5	15.4	15.7	50.0	38.5	1.9	9.6
Haverhill	78.6	94.6	10.7	12.5	28.6	42.9	7.1	21.4
Lawrence	88.5	94.8	8.3	10.9	22.5	45.5	12.6	19.4
Lowell	90.7	96.2	7.1	6.5	40.7	29.7	6.6	23.1
Lynn	85.2	91.9	7.4	6.0	39.6	38.2	8.3	13.9
Malden	88.2	94.1	5.9	5.9	52.9	29.4	0.0	17.6
Medford	57.1	100.0	7.1	7.1	28.6	35.7	14.3	21.4
Methuen	65.4	88.5	19.2	15.4	34.6	38.5	11.5	15.4
New Bedford	66.2	95.8	9.2	10.5	37.1	37.9	10.0	15.0
Newton	85.7	100.0	28.6	28.6	57.1	28.6	0.0	14.3
Peabody	73.3	100.0	17.6	23.5	33.3	33.3	0.0	33.3
Pittsfield	82.6	91.3	6.5	2.2	15.2	39.1	28.3	17.4
Plymouth	65.4	96.2	11.5	7.7	24.0	52.0	8.0	16.0
Quincy	61.3	83.9	12.9	12.9	32.3	48.4	6.5	12.9
Revere	78.4	100.0	8.1	5.4	58.3	16.7	2.8	22.2
Somerville	73.3	93.3	10.0	10.0	40.0	36.7	6.7	16.7
Springfield	87.8	95.4	12.1	12.7	28.3	39.4	7.8	24.5
Taunton	47.8	93.9	8.2	16.3	25.5	48.9	8.5	17.0
Waltham	82.4	88.2	0.0	0.0	35.3	41.2	0.0	23.5
Weymouth	92.9	92.9	7.1	7.1	21.4	50.0	0.0	28.6
Worcester	72.5	94.3	4.9	5.7	22.5	44.7	15.2	17.6

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. The 30 largest municipalities are the cities and towns in Massachusetts with the largest populations according to the Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October 2006 (see Technical Notes in Appendix). 2. Birth rates represent the number of births per 1,000 females ages 15-19. Birth rates for cities and towns were calculated using MDPH population estimates for 2010. 3. Mothers who designated themselves as Asian, American Indian, or Other. 4. Calculations based on values of 1-4 are excluded. 5. See Glossary under "Prenatal Care Payment Source." 6. Less than 2,500 grams or 5.5 pounds. 7. Less than 37 weeks of gestational age. 8. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary and Technical Notes in the Appendix for definitions of index and adequacy categories. 9. Inadequate includes those mothers with no prenatal care.

Table 21. Trends in Infant, Neonatal, and Post Neonatal Mortality by Race[1], Massachusetts: 1981-2010

INFANT MORTALITY (less than one year of age)

	State Total[2]		White		Black		Asian/Other[3]	
Year	n	Rate[4]	n	Rate[4]	n	Rate[4]	n	Rate[4]
1981	710	9.6	616	9.1	85	18.2	8	6.1
1982	764	10.1	656	9.4	102	21.3	5	3.3
1983	682	9.0	579	8.3	89	19.0	12	7.4
1984	699	8.9	601	8.4	82	16.4	13	7.5
1985	745	9.1	608	8.1	126	23.8	11	6.1
1986	695	8.4	560	7.5	123	22.0	11	4.6
1987	608	7.2	486	6.4	110	17.5	12	4.5
1988	693	7.9	546	7.0	133	19.5	13	3.8
1989	697	7.6	549	6.8	131	17.7	17	4.8
1990	649	7.0	519	6.4	106	13.7	24	6.5
1991	577	6.5	461	6.0	102	13.8	14	3.9
1992	569	6.5	438	5.7	114	15.8	17	4.7
1993	523	6.2	423	5.7	87	12.5	13	3.5
1994	499	6.0	407	5.6	81	12.0	11	2.9
1995	419	5.1	333	4.7	65	10.3	21	5.5
1996	403	5.0	329	4.7	65	10.8	8	2.0
1997	425	5.3	349	5.0	66	10.6	10	2.4
1998	414	5.1	345	4.9	59	9.3	10	2.3
1999	418	5.2	334	4.8	75	11.4	9	1.9
2000	377	4.6	280	4.0	76	11.7	19	3.6
2001	407	5.0	314	4.5	77	11.7	16	3.0
2002	397	4.9	306	4.5	74	11.1	17	2.9
2003	383	4.8	290	4.3	78	11.8	15	2.6
2004	376	4.8	285	4.3	75	11.1	15	2.5
2005	391	5.1	308	4.8	63	9.3	20	3.5
2006	369	4.8	283	4.4	75	10.5	10	1.7
2007	380	4.9	286	4.4	73	10.0	18	2.8
2008	382	5.0	280	4.4	83	11.5	19	2.9
2009	366	4.9	283	4.6	62	8.5	21	3.3
2010	319	4.4	226	3.8	62	8.8	26	4.1

Table 21 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality by Race[1], Massachusetts: 1981-2010

NEONATAL MORTALITY (birth to 27 days old)

	State Total[2]		White		Black		Asian/Other[3]	
Year	n	Rate[4]	n	Rate[4]	n	Rate[4]	n	Rate[4]
1981	510	6.9	442	6.5	59	12.4	5	3.8
1982	573	7.6	494	7.1	75	15.7	3	--[5]
1983	482	6.3	411	5.9	63	13.4	7	4.3
1984	472	6.0	411	5.8	49	9.8	8	4.6
1985	538	6.6	447	6.0	85	16.0	5	2.8
1986	478	5.8	383	5.2	89	15.9	5	2.1
1987	432	5.1	343	4.6	80	12.7	9	3.4
1988	477	5.4	383	4.9	87	12.8	6	1.8
1989	479	5.2	376	4.7	95	12.8	8	2.3
1990	446	4.8	347	4.3	80	10.3	9	5.1
1991	401	4.5	319	4.1	72	9.8	10	2.8
1992	415	4.8	325	4.3	79	10.9	11	3.1
1993	375	4.4	300	4.1	66	9.5	9	2.4
1994	349	4.2	280	3.8	60	8.9	9	2.4
1995	298	3.6	237	3.3	50	7.9	11	2.9
1996	290	3.6	249	3.5	35	5.8	5	1.2
1997	323	4.0	271	3.9	45	7.2	7	1.7
1998	315	3.9	261	3.7	47	7.4	7	1.6
1999	332	4.1	265	3.8	61	9.3	6	1.3
2000	288	3.5	214	3.1	58	8.9	14	2.7
2001	308	3.8	239	3.5	59	9.0	10	1.9
2002	299	3.7	235	3.4	51	7.6	13	2.2
2003	285	3.6	217	3.2	58	8.8	10	1.8
2004	291	3.7	224	3.4	54	8.0	13	2.2
2005	282	3.7	226	3.5	45	6.6	11	1.9
2006	279	3.6	215	3.3	56	7.8	7	1.2
2007	263	3.4	194	3.0	52	7.2	15	2.4
2008	291	3.8	218	3.4	62	8.6	11	1.7
2009	276	3.7	216	3.5	42	5.8	18	2.8
2010	238	3.3	167	2.8	47	6.6	21	3.3

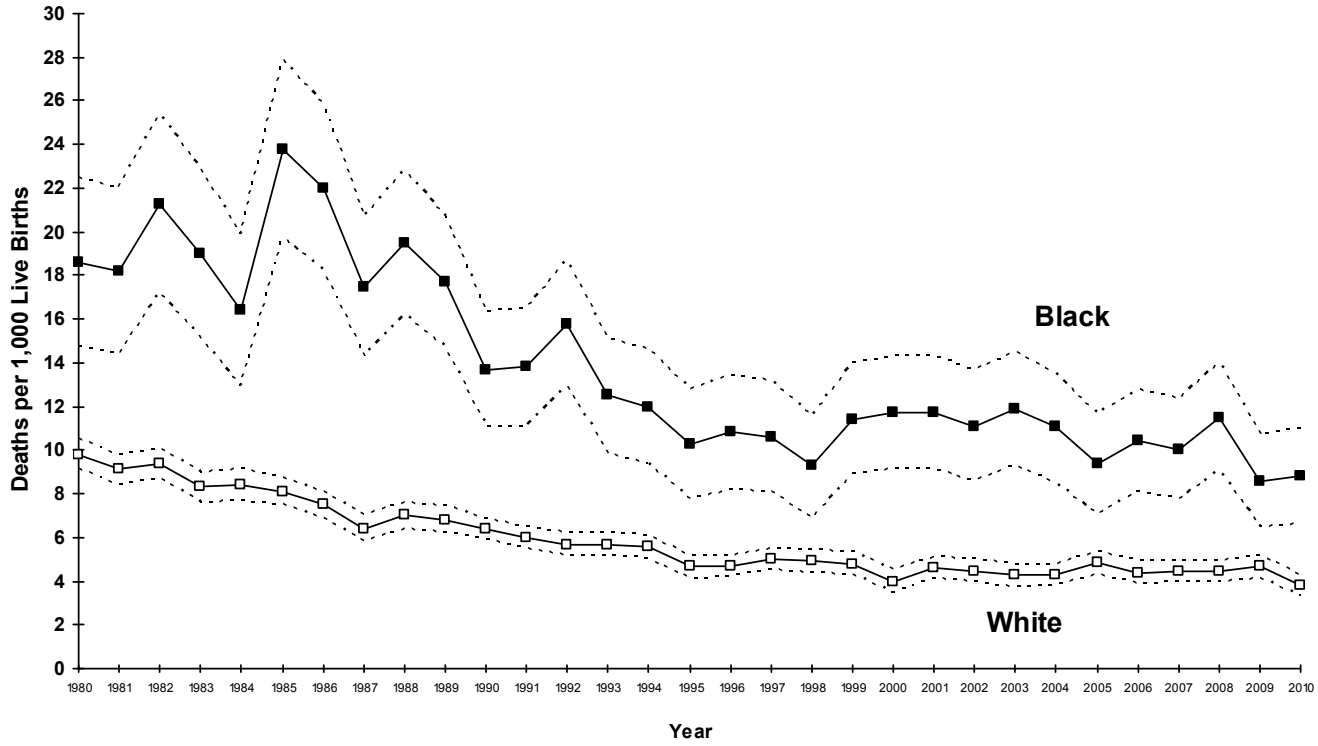
Table 21 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality by Race[1], Massachusetts: 1981-2010

POST NEONATAL MORTALITY (28-364 days old)

	State Total[2]		White		Black		Asian/Other[3]	
Year	n	Rate[4]	n	Rate[4]	n	Rate[4]	n	Rate[4]
1981	200	2.7	174	2.6	26	5.8	3	--[5]
1982	191	2.5	162	2.3	27	5.6	2	--[5]
1983	200	2.7	168	2.4	26	5.6	5	3.1
1984	227	2.9	190	2.6	33	6.6	5	2.9
1985	207	2.5	161	2.1	41	7.8	6	3.3
1986	217	2.6	177	2.3	34	6.1	6	2.5
1987	176	2.1	143	1.8	30	4.8	3	--[5]
1988	216	2.5	163	2.1	46	6.7	7	2.0
1989	218	2.4	173	2.1	36	4.9	9	2.5
1990	203	2.2	172	2.1	26	3.4	5	1.4
1991	176	2.0	142	1.8	30	4.1	4	--[5]
1992	154	1.8	113	1.5	35	4.8	6	1.7
1993	148	1.7	123	1.7	21	3.0	4	--[5]
1994	150	1.8	127	1.7	21	3.1	2	--[5]
1995	121	1.5	96	1.3	15	2.4	10	2.6
1996	113	1.4	80	1.1	30	5.0	3	--[5]
1997	102	1.3	78	1.1	21	3.4	3	--[5]
1998	99	1.2	84	1.2	12	1.9	3	--[5]
1999	86	1.1	69	1.0	14	2.1	3	--[5]
2000	89	1.1	66	0.9	18	2.8	5	1.0
2001	99	1.2	75	1.1	18	2.7	6	1.1
2002	98	1.2	71	1.0	23	3.4	4	--[5]
2003	98	1.2	73	1.1	20	3.0	5	0.9
2004	85	1.1	61	0.9	21	3.1	3	--[5]
2005	109	1.4	82	1.3	18	2.7	7	1.6
2006	90	1.2	68	1.1	19	2.6	3	--[5]
2007	117	1.5	92	1.4	21	2.9	3	--[5]
2008	91	1.2	62	1.0	21	2.9	8	1.2
2009	90	1.2	67	1.1	20	2.7	3	--[5]
2010	81	1.1	59	1.0	15	2.1	5	0.8

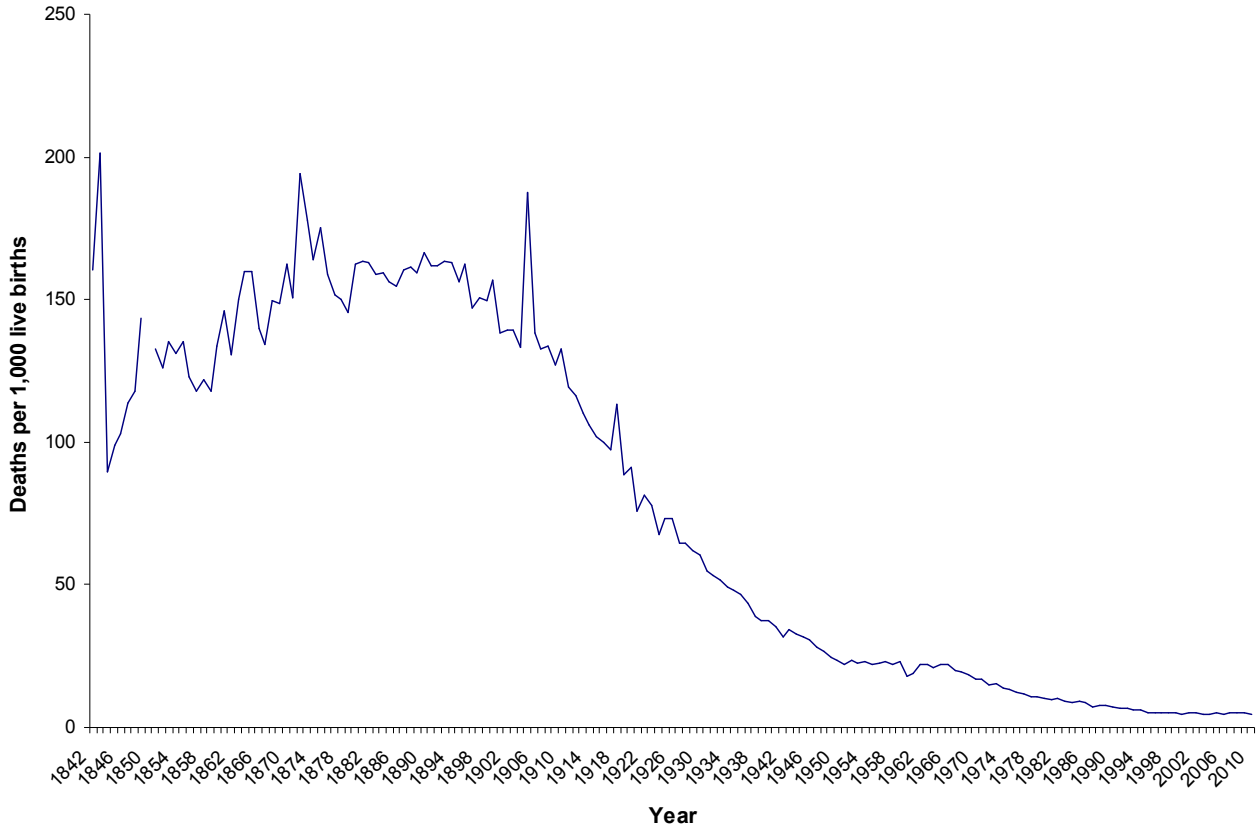
Note: Infant deaths are based on the death file as June 27, 2012.
1. Hispanic origin could not be identified from the Massachusetts death certificate before 1989; thus, Hispanic trend data are not available. Most Hispanics are included in the race category of White. Hispanic infant mortality data for the years 1990 through 2005 are presented in Table 11. 2. Deaths of infants of unknown race are included in the total calculation. For rate computations, infants of unknown race are allocated into the race categories according to the distribution of births of known race. 3. Other: American Indian and Other races. 4. Rates are expressed per 1,000 live births. 5. Calculations based on values of 1-4 are excluded.

Figure 16. Infant Mortality Rates and 95% Confidence Intervals by Race, Massachusetts: 1980-2010[1,2,3]



1. See Technical Notes for explanation. 2. For rate computations, infant births of unknown race are allocated into race categories according to the distribution of the births of known race. 3. On tables and graphs which include data prior to June 1986, the race classifications do not include ethnicity; most Hispanics are included in the race category of whites.

Figure 17. Infant Mortality Rates, Massachusetts: 1842-2010



NOTE: Data not available for 1850.

Figure 18. Trends in the Timing of Infant Deaths, Massachusetts: 1990-2010

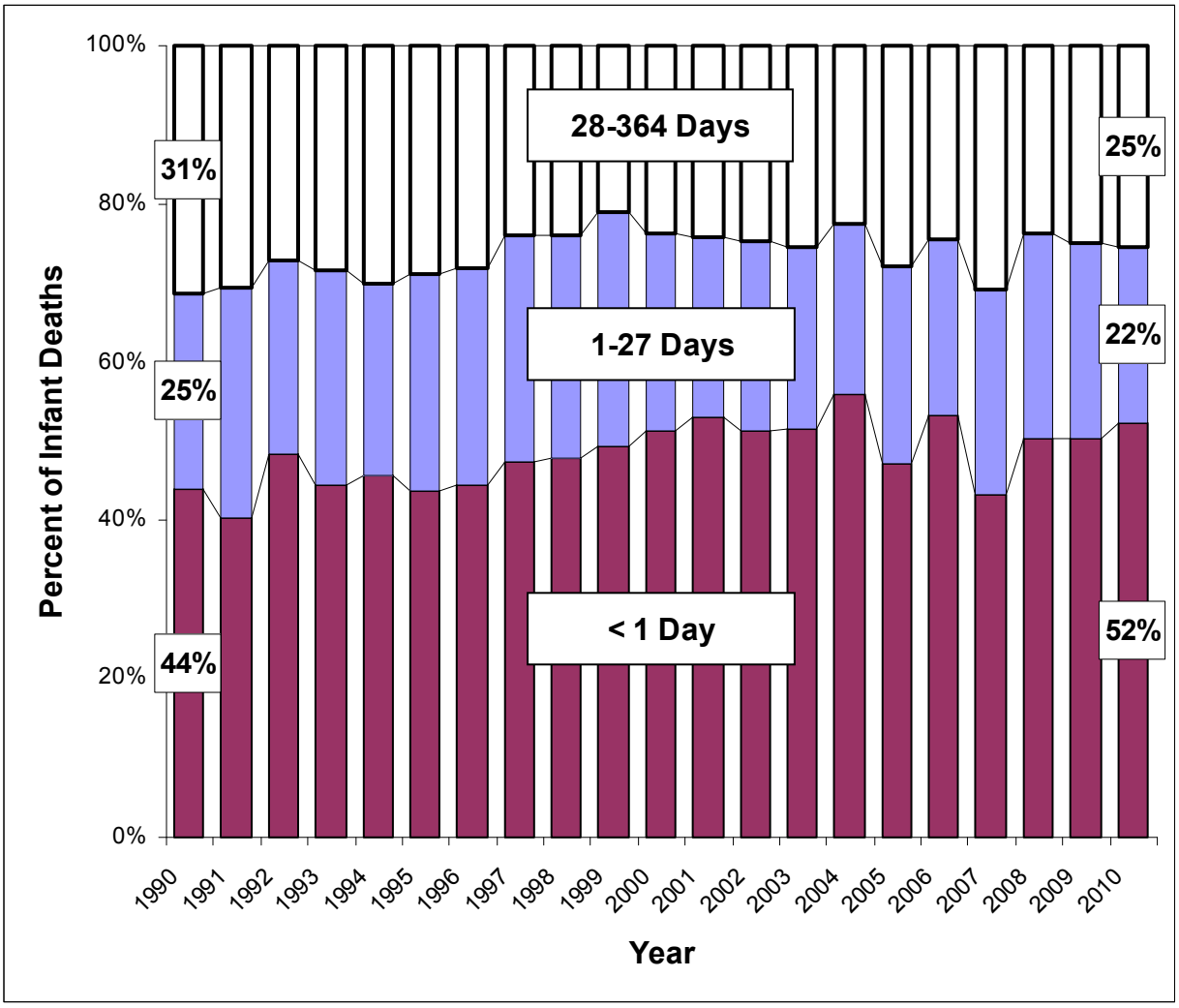


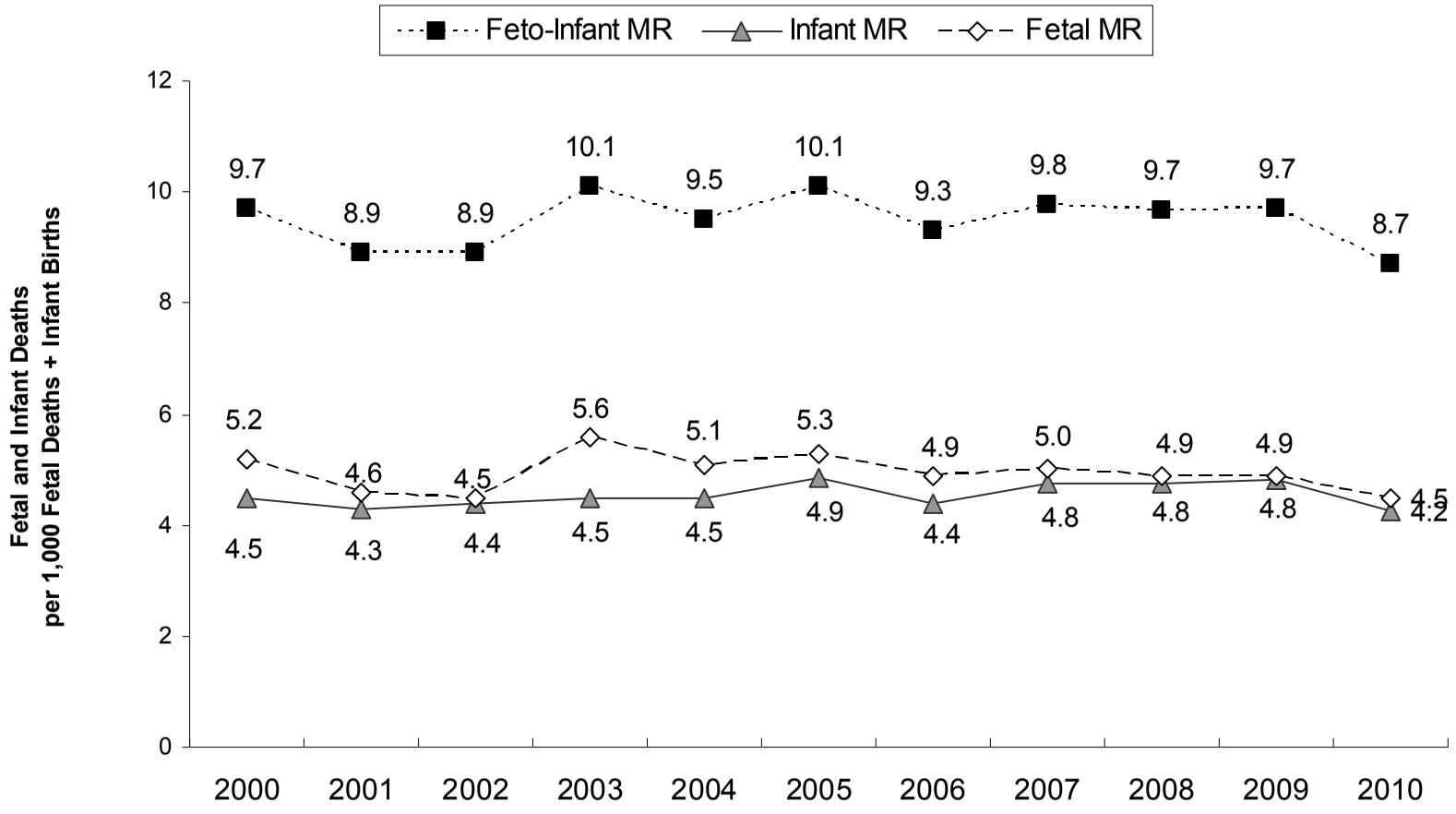
Table 22. Feto-Infant Mortality Rate[1] by Birthweight, Massachusetts: 2001-2010

Birthweight	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<500	938.3	943.5	923.1	912.0	910.9	943.2	934.1	944.9	926.4	955.6
500-749	487.0	525.5	523.4	561.8	564.7	544.1	487.3	588.0	482.5	523.8
750-999	146.9	188.6	220.7	157.7	187.8	247.2	282.2	238.1	243.2	231.1
1,000-1,249	83.0	131.4	142.9	124.1	100.7	112.4	87.3	80.4	133.0	101.7
1,250-1,499	84.6	95.8	67.7	74.4	73.6	65.8	63.3	72.1	87.5	70.0
1,500-1,999	40.3	38.3	31.3	38.0	37.2	35.2	39.1	32.5	41.7	26.5
2,000-2,499	12.2	11.9	16.4	14.8	12.8	15.2	14.6	16.0	16.9	11.4
2,500-4,000	2.6	2.5	2.3	2.5	2.4	2.4	2.7	2.4	2.5	2.2
4001+	1.5	1.7	2.5	1.3	2.5	2.3	2.3	1.4	1.9	1.7
Unknown Birthweight	*(23)*	*(17)*	*(30)*	*(19)*	*(11)*	*(34)*	*(10)*	*(16)*	*(14)*	*(12)*
Feto-Infant Mortality Rate[2]	**9.7**	**9.1**	**10.3**	**9.5**	**10.1**	**9.3**	**9.8**	**9.7**	**9.7**	**8.7**

1. Fetal and infant deaths per 1,000 live births plus fetal deaths. 2. The feto-infant mortality rate is calculated here *excluding* fetal deaths, infant deaths, and births of *unknown birthweight*.

Source: Starting with *Massachusetts Births 2003*, linked death-cohort files of MA resident infant deaths for the years 2000-2010 have been used for the calculation of infant mortality.

Figure 19. Feto-Infant Mortality Rate, Massachusetts: 2000-2010



NOTES: In this graph, Infant, Fetal, and Feto-Infant Mortality Rates include all deaths (including those with unknown birthweight). The Infant Mortality Rate in this graph includes fetal deaths in the denominator unlike the conventional IMR. The Infant Mortality Rate and Fetal Mortality Rate may not add up to the Feto-Infant Mortality Rate due to rounding.

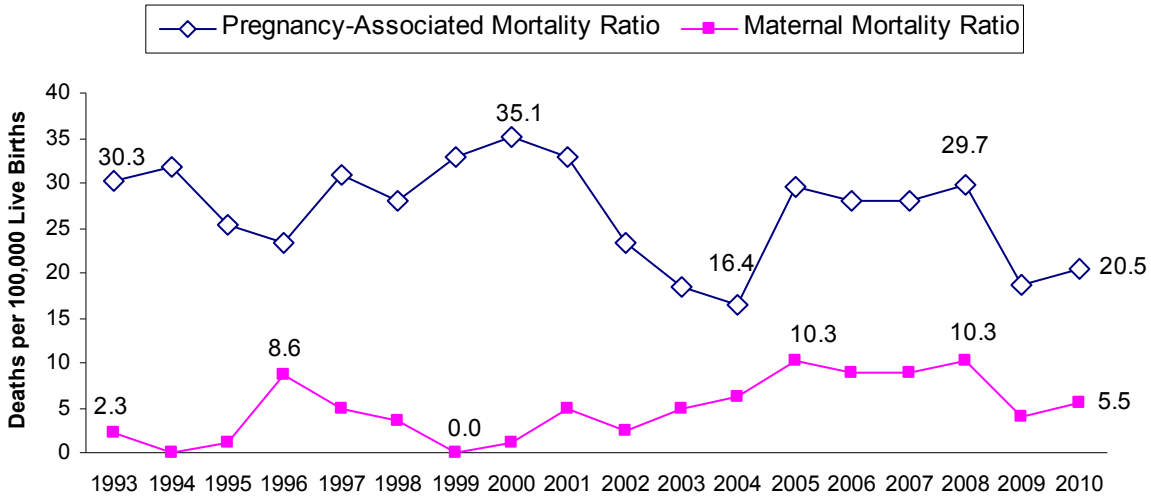
Source: Starting with *Massachusetts Births 2003*, linked death-cohort files of MA resident infant deaths for the years 2000-2009 have been used for the calculation of infant mortality.

Table 23. Fetal and Infant Deaths by Birthweight and Gestational Age, Massachusetts: 1998-2010

Year	Fetals <24 wks or <500 grams	Fetals ≥ 24 wks and ≥ 500 grams	Infants <24 wks or <500 grams	Infants ≥ 24 wks and ≥ 500 grams	Total
1998	216 (25.5%)	219 (25.8%)	183 (21.6%)	230 (27.1%)	848 (100.0%)
1999	214 (25.4%)	215 (25.6%)	196 (23.3%)	216 (25.7%)	841 (100.0%)
2000	203 (25.1%)	234 (28.9%)	168 (20.7%)	205 (25.3%)	810 (100.0%)
2001	174 (22.0%)	214 (27.1%)	197 (24.9%)	206 (26.0%)	791 (100.0%)
2002	165 (22.3%)	210 (28.3%)	185 (25.0%)	181 (24.4%)	741 (100.0%)
2003	218 (26.3%)	246 (29.6%)	189 (22.8%)	177 (21.3%)	830 (100.0%)
2004	177 (22.7%)	240 (30.8%)	182 (23.3%)	181 (23.2%)	780 (100.0%)
2005	210 (26.3%)	213 (26.7%)	174 (21.8%)	201 (25.2%)	798 (100.0%)
2006	178 (24.1%)	210 (28.5%)	173 (23.4%)	177 (24.0%)	738 (100.0%)
2007	184 (23.7%)	215 (27.7%)	149 (19.2%)	227 (29.3%)	775 (100.0%)
2008	178 (23.5%)	209 (27.5%)	194 (25.6%)	178 (23.5%)	759 (100.0%)
2009	158 (21.3%)	221 (29.8%)	162 (21.8%)	201 (27.1%)	742 (100.0%)
2010	150 (23.1%)	180 (27.7%)	153 (23.6%)	166 (25.6%)	649 (100.0%)

Source: Starting with *Massachusetts Births 2003*, linked death-cohort files of MA resident infant deaths for the years 1998-2010 have been used for the calculation of infant mortality.

Figure 20. Trends in Pregnancy-Associated and Maternal Mortality, Massachusetts: 1993-2010



NOTE: Ratios shown in graph are per 100,000 live births. Ratios are based on occurrence births, not resident births.

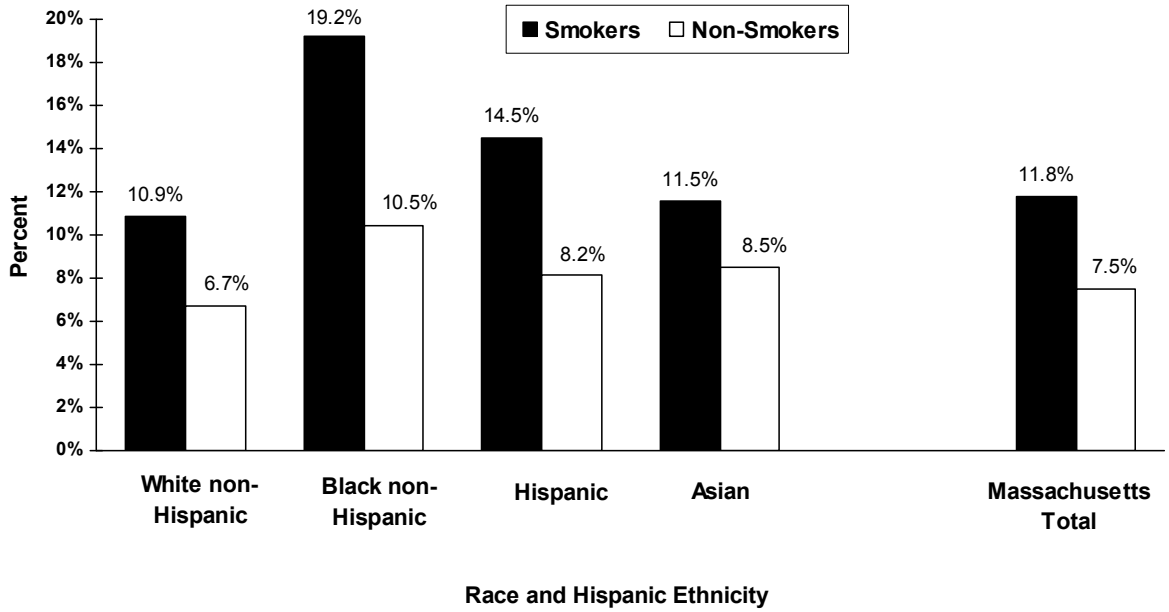
Pregnancy-associated death is defined as the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. The pregnancy-associated mortality ratio is the number of pregnancy-associated deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for further information). Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes. Maternal mortality ratio is the number of maternal deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for more information.)

Table 24. Number of Pregnancy-Associated and Maternal Deaths, Massachusetts: 1999-2010

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Pregnancy Associated Deaths[1]	27	29	27	19	15	13	23	22	22	24	14	15
Maternal Deaths[2]	0	1	4	2	4	5	8	7	7	8	3	4

1. Pregnancy-associated death is defined as the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. 2. Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes.

Figure 21. Low Birthweight among Smoking and Non-Smoking Mothers by Race/Hispanic Ethnicity, Massachusetts: 2010



NOTE: Maternal smoking is self-reported on the Parent Worksheet of the Birth Certificate; these data should be interpreted cautiously. Low birthweight: less than 2,500 grams or 5.5 pounds.

Table 25. Low Birthweight (LBW) by Maternal Age, Race/Hispanic Ethnicity, Massachusetts: 2010

Mother's Age	Total LBW[1] Infants		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[4]		Unknown[5]
(in years)	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n
State Total[2]	**5,650**	**7.8**	**3,411**	**7.0**	**740**	**10.9**	**893**	**8.4**	**502**	**8.6**	**93**	**8.6**	**10**
<18	116	9.9	32	8.1	26	15.8	52	9.4	5	11.9	1	--[6]	0
18-19	241	8.7	98	7.6	40	11.1	95	9.6	3	--[6]	5	9.6	0
20-24	862	7.6	395	6.4	164	11.4	245	8.1	44	9.1	14	7.3	0
25-29	1,286	7.1	775	6.6	158	9.3	198	7.0	133	8.8	19	6.0	3
30-34	1,676	7.2	1,094	6.5	180	10.5	179	9.2	185	8.3	35	11.4	3
35-39	1,100	8.5	760	8.0	120	11.3	97	9.4	100	8.1	19	12.0	4
40+	368	11.0	257	10.3	52	14.7	27	11.9	32	12.7	0	0.0	0

NOTE: 1. Low Birthweight (LBW): less than 2,500 grams or 5.5 pounds. 2. State totals include women of unknown age. 3. Percentages are based upon the number of low birthweight infants divided by the total births in each age and race/ethnicity category. 4. Other races include American Indian and others not specified. 5. Race and/or mother's age unknown. 6. Calculations based on values of 1-4 are excluded.

Table 26. Adequacy of Prenatal Care Utilization: Summary and Component Indices, Massachusetts: 2010

	Adequate Total[1]		Adequate Intensive[2]		Adequate Basic[2]		Intermediate[2]		Inadequate[2]		Unknown[2]
	n	%	n	%	n	%	n	%	n	%	n
Summary Index[3]											
Adequacy of Prenatal Care Utilization	60,782	84.9	27,756	38.8	33,026	46.1	4,770	6.7	6,062	8.5	1,221
Component Indices[3]											
Adequacy of Initiation	65,964	92.1	30,664	42.8	35,300	49.3	3,430	4.8	2,220	3.1	1,221
Adequacy of Received Services (Visits)	65,768	91.8	31,766	44.4	34,002	47.5	5,145	7.2	701	1.0	1,221

NOTE: All percentages are calculated based on the Adequacy of Prenatal Care Utilization (APNCU) Index.

1. Adequate Total is the sum of Adequate Intensive and Adequate Basic categories. 2. For definitions of these categories, please see the Technical Notes in the Appendix. 3. For an explanation of the APNCU Index (summary index) and its component indices, please see Technical Notes in the Appendix (page 102).

Table 27. Adequacy of Prenatal Care Summary by Selected Characteristics, Massachusetts: 2010

Summary Index	Adequate Total[1]		Adequate Intensive		Adequate Basic		Intermediate		Inadequate		Unknown
	n	%	n	%	n	%	n	%	n	%	n
State Total	**60,783**	**84.9%**	**27,757**	**38.8%**	**33,026**	**46.1%**	**4,770**	**6.7%**	**6,062**	**8.5%**	**1,221**
Maternal Demographics											
Age											
<18	807	70.0%	383	33.2%	424	36.8%	100	8.7%	246	21.3%	22
18-19	2,054	75.0%	932	34.1%	1,122	41.0%	247	9.0%	436	15.9%	34
20-24	8,643	77.7%	3,828	34.4%	4,815	43.3%	985	8.9%	1,492	13.4%	178
25-29	14,939	84.3%	6,763	38.1%	8,176	46.1%	1,291	7.3%	1,499	8.5%	314
30-34	20,075	88.2%	8,989	39.5%	11,086	48.7%	1,290	5.7%	1,391	6.1%	403
35-39	11,328	88.4%	5,321	41.5%	6,007	46.9%	710	5.5%	780	6.1%	202
40+	2,936	89.0%	1,541	46.7%	1,395	42.3%	147	4.5%	216	6.5%	66
Educational Attainment											
< High school	5,216	73.2%	2,566	36.0%	2,650	37.2%	653	9.2%	1,255	17.6%	117
High school	14,461	80.5%	6,685	37.2%	7,776	43.3%	1,561	8.7%	1,952	10.9%	267
Some college	12,441	85.5%	5,874	40.4%	6,567	45.1%	875	6.0%	1,240	8.5%	271
College	16,964	89.5%	7,433	39.2%	9,531	50.3%	985	5.2%	1,000	5.3%	317
> College	11,612	90.0%	5,147	39.9%	6,465	50.1%	695	5.4%	595	4.6%	188
Race/Ethnicity											
Hispanic	8,274	79.0%	3,823	36.5%	4,451	42.5%	888	8.5%	1,313	12.5%	113
White non-Hispanic	41,540	87.3%	18,984	39.9%	22,556	47.4%	2,960	6.2%	3,083	6.5%	884
Black non-Hispanic	5,137	76.8%	2,247	33.6%	2,890	43.2%	523	7.8%	1,030	15.4%	104
Asian	4,901	85.1%	2,290	39.8%	2,611	45.4%	335	5.8%	521	9.0%	60
Other	889	84.2%	395	37.4%	494	46.8%	63	6.0%	104	9.8%	27
Birthplace											
US/D.C.	43,227	86.2%	19,704	39.3%	23,523	46.9%	3,247	6.5%	3,647	7.3%	937
Puerto Rico/US Terr.	1,372	76.0%	637	35.3%	735	40.7%	182	10.1%	252	14.0%	14
Non-US-born	16,181	82.2%	7,415	37.7%	8,766	44.5%	1,341	6.8%	2,162	11.0%	268
Pregnancy-Related Factors											
Parity[2]											
1	27,646	84.9%	12,488	38.4%	15,158	46.6%	2,172	6.7%	2,738	8.4%	494
2-3	29,499	85.8%	13,512	39.3%	15,987	46.5%	2,240	6.5%	2,630	7.7%	530
4+	3,534	77.4%	1,710	37.4%	1,824	39.9%	353	7.7%	681	14.9%	74
Smoking[3]											
Yes	3,319	73.6%	1,677	37.2%	1,642	36.4%	387	8.6%	802	17.8%	71
No	57,391	85.6%	26,046	38.9%	31,345	46.8%	4,383	6.5%	5,248	7.8%	1,114
Birth Outcomes											
Plurality											
Singleton	57,785	84.5%	25,200	36.9%	32,585	47.7%	4,709	6.9%	5,852	8.6%	1,163
Multiple birth	2,998	91.7%	2,557	78.2%	441	13.5%	61	1.9%	210	6.4%	58
Birthweight											
<500 g	84	89.4%	81	86.2%	3	--[4]	2	--[4]	8	8.5%	9
500-1,499 g	731	89.6%	661	81.0%	70	8.6%	17	2.1%	68	8.3%	42
1,500-2,499 g	3,924	85.8%	3,085	67.4%	839	18.3%	200	4.4%	450	9.8%	115
2,500-3,999 g	50,448	84.7%	21,797	36.6%	28,651	48.1%	4,055	6.8%	5,034	8.5%	901
4,000+ g	5,576	84.9%	2,118	32.3%	3,458	52.7%	495	7.5%	494	7.5%	110
Gestational Age											
<28 weeks	356	88.8%	329	82.0%	27	6.7%	11	2.7%	34	8.5%	35
<37 weeks	5,286	87.5%	4,582	75.9%	704	11.7%	201	3.3%	553	9.2%	195
37-42 weeks	55,482	84.7%	23,166	35.3%	32,316	49.3%	4,565	7.0%	5,491	8.4%	986

NOTE: All percentages are calculated based on the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories.
1. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 2. Parity is the number of live births including this birth. 3. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 4. Calculations based on values of 1-4 are excluded.

Table 28. Adequacy of Prenatal Care Initiation by Selected Characteristics, Massachusetts: 2010

Based on month of PNC Initiation	Adequate Total[1]		Adequate Intensive		Adequate Basic		Intermediate		Inadequate		Unknown
	n	%	n	%	n	%	n	%	n	%	n
State Total	**65,965**	**92.1%**	**30,664**	**42.8%**	**35,301**	**49.3%**	**3,430**	**4.8%**	**2,220**	**3.1%**	**1,221**
Maternal Demographics											
Age											
<18	913	79.2%	309	26.8%	604	52.4%	161	14.0%	79	6.9%	22
18-19	2,318	84.7%	934	34.1%	1,384	50.6%	268	9.8%	151	5.5%	34
20-24	9,730	87.5%	3,949	35.5%	5,781	52.0%	868	7.8%	522	4.7%	178
25-29	16,340	92.2%	7,486	42.2%	8,854	49.9%	840	4.7%	549	3.1%	314
30-34	21,459	94.3%	10,548	46.4%	10,911	47.9%	759	3.3%	538	2.4%	403
35-39	12,106	94.4%	5,915	46.1%	6,191	48.3%	413	3.2%	299	2.3%	202
40+	3,098	93.9%	1,523	46.2%	1,575	47.7%	121	3.7%	80	2.4%	66
Educational Attainment											
< High school	5,934	83.3%	2,199	30.9%	3,735	52.4%	753	10.6%	437	6.1%	117
High school	16,164	89.9%	6,777	37.7%	9,387	52.2%	1,139	6.3%	671	3.7%	267
Some college	13,399	92.1%	6,012	41.3%	7,387	50.7%	724	5.0%	433	3.0%	271
College	18,026	95.1%	9,455	49.9%	8,571	45.2%	500	2.6%	423	2.2%	317
> College	12,351	95.7%	6,194	48.0%	6,157	47.7%	307	2.4%	244	1.9%	188
Race/Ethnicity											
Hispanic	9,240	88.2%	3,895	37.2%	5,345	51.0%	811	7.7%	424	4.0%	113
White non-Hispanic	44,741	94.0%	21,197	44.5%	23,544	49.5%	1,770	3.7%	1,072	2.3%	884
Black non-Hispanic	5,723	85.5%	2,680	40.1%	3,043	45.5%	485	7.2%	482	7.2%	104
Asian	5,256	91.3%	2,382	41.4%	2,874	49.9%	307	5.3%	194	3.4%	60
Other	962	91.1%	494	46.8%	468	44.3%	54	5.1%	40	3.8%	27
Birthplace											
US/D.C.	46,753	93.3%	22,064	44.0%	24,689	49.3%	2,152	4.3%	1,216	2.4%	937
Puerto Rico/US Terr.	1,570	86.9%	614	34.0%	956	52.9%	169	9.4%	67	3.7%	14
Non-US-born	17,639	89.6%	7,986	40.6%	9,653	49.0%	1,109	5.6%	936	4.8%	268
Pregnancy-Related Factors											
Parity[2]											
1	29,977	92.1%	14,249	43.8%	15,728	48.3%	1,529	4.7%	1,050	3.2%	494
2-3	31,945	92.9%	14,784	43.0%	17,161	49.9%	1,506	4.4%	918	2.7%	530
4+	3,934	86.1%	1,564	34.2%	2,370	51.9%	390	8.5%	244	5.3%	74
Smoking[3]											
Yes	3,761	83.4%	1,406	31.2%	2,355	52.2%	460	10.2%	287	6.4%	71
No	62,130	92.7%	29,228	43.6%	32,902	49.1%	2,967	4.4%	1,925	2.9%	1,114
Birth Outcomes											
Plurality											
Singleton	62,901	92.0%	29,100	42.6%	33,801	49.5%	3,265	4.8%	2,180	3.2%	1,163
Multiple birth	3,064	93.7%	1,564	47.8%	1,500	45.9%	165	5.0%	40	1.2%	58
Birthweight											
<500 g	86	91.5%	29	30.9%	57	60.6%	4	--[4]	4	--[4]	9
500-1,499 g	750	91.9%	364	44.6%	386	47.3%	46	5.6%	20	2.5%	42
1,500-2,499 g	4,150	90.7%	1,969	43.0%	2,181	47.7%	272	5.9%	152	3.3%	115
2,500-3,999 g	54,859	92.1%	25,432	42.7%	29,427	49.4%	2,804	4.7%	1,874	3.1%	901
4,000+ g	6,099	92.9%	2,860	43.6%	3,239	49.3%	303	4.6%	163	2.5%	110
Gestational Age											
<28 weeks	367	91.5%	165	41.1%	202	50.4%	21	5.2%	13	3.2%	35
<37 weeks	5,522	91.4%	2,702	44.7%	2,820	46.7%	320	5.3%	198	3.3%	195
37-42 weeks	60,422	92.2%	27,950	42.6%	32,472	49.5%	3,108	4.7%	2,008	3.1%	986

NOTE: All percentages are calculated based on the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories.
1. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 2. Parity is the number of live births including this birth. 3. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 4. Calculations based on values of 1-4 are excluded.

Table 29 Adequacy of Prenatal Care Visits by Selected Characteristics, Massachusetts: 2010

Based on number of PNC Visits	Adequate Total[1]		Adequate Intensive		Adequate Basic		Intermediate		Inadequate		Unknown
	n	%	n	%	n	%	n	%	n	%	n
State Total	**65,769**	**91.8%**	**31,767**	**44.4%**	**34,002**	**47.5%**	**5,145**	**7.2%**	**701**	**1.0%**	**1,221**
Maternal Demographics											
Age											
<18	1,011	87.7%	546	47.4%	465	40.3%	122	10.6%	20	1.7%	22
18-19	2,401	87.7%	1,193	43.6%	1,208	44.1%	294	10.7%	42	1.5%	34
20-24	9,855	88.6%	4,795	43.1%	5,060	45.5%	1,091	9.8%	174	1.6%	178
25-29	16,159	91.1%	7,739	43.7%	8,420	47.5%	1,378	7.8%	192	1.1%	314
30-34	21,241	93.3%	9,934	43.7%	11,307	49.7%	1,367	6.0%	148	0.7%	403
35-39	11,974	93.4%	5,863	45.7%	6,111	47.7%	740	5.8%	104	0.8%	202
40+	3,127	94.8%	1,697	51.4%	1,430	43.3%	153	4.6%	19	0.6%	66
Educational Attainment											
< High school	6,215	87.2%	3,322	46.6%	2,893	40.6%	758	10.6%	151	2.1%	117
High school	16,025	89.2%	7,908	44.0%	8,117	45.2%	1,714	9.5%	235	1.3%	267
Some college	13,474	92.6%	6,712	46.1%	6,762	46.5%	936	6.4%	146	1.0%	271
College	17,817	94.0%	8,171	43.1%	9,646	50.9%	1,028	5.4%	104	0.5%	317
> College	12,140	94.1%	5,594	43.4%	6,546	50.7%	708	5.5%	54	0.4%	188
Race/Ethnicity											
Hispanic	9,368	89.4%	4,661	44.5%	4,707	44.9%	973	9.3%	134	1.3%	113
White non-Hispanic	44,047	92.6%	21,039	44.2%	23,008	48.4%	3,147	6.6%	389	0.8%	884
Black non-Hispanic	5,976	89.3%	2,906	43.4%	3,070	45.9%	599	9.0%	115	1.7%	104
Asian	5,365	93.2%	2,680	46.6%	2,685	46.6%	356	6.2%	36	0.6%	60
Other	968	91.7%	461	43.7%	507	48.0%	69	6.5%	19	1.8%	27
Birthplace											
US/D.C.	46,153	92.1%	22,069	44.0%	24,084	48.1%	3,488	7.0%	480	1.0%	937
Puerto Rico/US Terr.	1,577	87.3%	792	43.9%	785	43.5%	199	11.0%	30	1.7%	14
Non-US-born	18,036	91.6%	8,905	45.2%	9,131	46.4%	1,458	7.4%	190	1.0%	268
Pregnancy-Related Factors											
Parity[2]											
1	29,956	92.0%	14,401	44.2%	15,555	47.8%	2,332	7.2%	268	0.8%	494
2-3	31,651	92.1%	15,214	44.3%	16,437	47.8%	2,397	7.0%	321	0.9%	530
4+	4,052	88.7%	2,100	46.0%	1,952	42.7%	411	9.0%	105	2.3%	74
Smoking[3]											
Yes	3,929	87.2%	2,153	47.8%	1,776	39.4%	449	10.0%	130	2.9%	71
No	61,764	92.2%	29,577	44.1%	32,187	48.0%	4,696	7.0%	562	0.8%	1,114
Birth Outcomes											
Plurality											
Singleton	62,587	91.6%	29,042	42.5%	33,545	49.1%	5,070	7.4%	689	1.0%	1,163
Multiple birth	3,182	97.3%	2,725	83.4%	457	14.0%	75	2.3%	12	0.4%	58
Birthweight											
<500 g	88	93.6%	84	89.4%	4	--[4]	2	--[4]	4	--[4]	9
500-1,499 g	784	96.1%	706	86.5%	78	9.6%	17	2.1%	15	1.8%	42
1,500-2,499 g	4,271	93.4%	3,379	73.9%	892	19.5%	225	4.9%	78	1.7%	115
2,500-3,999 g	54,610	91.7%	25,119	42.2%	29,491	49.5%	4,372	7.3%	555	0.9%	901
4,000+ g	5,995	91.3%	2,463	37.5%	3,532	53.8%	528	8.0%	42	0.6%	110
Gestational Age											
<28 weeks	378	94.3%	349	87.0%	29	7.2%	11	2.7%	12	3.0%	35
<37 weeks	5,708	94.5%	4,943	81.8%	765	12.7%	220	3.6%	112	1.9%	195
37-42 weeks	60,044	91.6%	26,813	40.9%	33,231	50.7%	4,921	7.5%	573	0.9%	986

NOTE: All percentages are calculated based on the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories.

1. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 2. Parity is the number of live births including this birth. 3. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 4. Calculations based on values of 1-4 are excluded.

Table 30. Birth Characteristics by Race/Hispanic Ethnicity and Source of Prenatal Care Payment, Massachusetts: 2010

Race/Ethnicity and Payment Source	Births[1]		Teen Births				Birthweight			
			<18 Years		<20 Years		Very Low[2]		Low[3]	
	n	%	n	%	n	%	n	%	n	%
STATE TOTAL[4]	**72,835**	**100.0**	**1,175**	**1.6**	**3,946**	**5.4**	**961**	**1.3**	**5,650**	**7.8**
Public	25,665	35.8	896	3.5	2,964	11.5	349	1.4	2,136	8.3
Medicaid[5]	19,485	27.2	705	3.6	2,324	11.9	264	1.4	1,602	8.2
Other Public[6]	6,180	8.6	191	3.1	640	10.4	85	1.4	534	8.6
Private[7]	44,986	62.8	253	0.6	889	2.0	529	1.2	3,223	7.2
White non-Hispanic	**48,466**	**100.0**	**396**	**0.8**	**1,690**	**3.5**	**530**	**1.1**	**3,411**	**7.0**
Public	11,876	25.0	256	2.2	1,093	9.2	136	1.1	925	7.8
Medicaid[5]	9,389	19.7	221	2.4	940	10.0	111	1.2	707	7.5
Other Public[6]	2,487	5.2	35	1.4	153	6.2	25	1.0	218	8.8
Private[7]	34,903	73.4	129	0.4	550	1.6	357	1.0	2,313	6.6
Black non-Hispanic	**6,794**	**100.0**	**165**	**2.4**	**525**	**7.7**	**159**	**2.3**	**740**	**10.9**
Public	4,012	59.7	115	2.9	397	9.9	76	1.9	426	10.6
Medicaid[5]	3,166	47.1	93	2.9	321	10.1	61	1.9	349	11.0
Other Public[6]	846	12.6	22	2.6	76	9.0	15	1.8	77	9.1
Private[7]	2,637	39.3	47	1.8	117	4.4	68	2.6	271	10.3
Hispanic	**10,588**	**100.0**	**552**	**5.2**	**1,537**	**14.5**	**166**	**1.6**	**893**	**8.4**
Public	7,749	73.7	478	6.2	1,321	17.0	104	1.3	617	8.0
Medicaid[5]	5,252	50.0	347	6.6	922	17.6	65	1.2	415	7.9
Other Public[6]	2,497	23.8	131	5.2	399	16.0	39	1.6	202	8.1
Private[7]	2,685	25.5	66	2.5	190	7.1	47	1.8	239	8.9
Asian	**5,817**	**100.0**	**42**	**0.7**	**119**	**2.0**	**81**	**1.4**	**502**	**8.6**
Public	1,465	25.3	32	2.2	97	6.6	27	1.8	128	8.7
Medicaid[5]	1,230	21.3	29	2.4	90	7.3	23	1.9	101	8.2
Other Public[6]	235	4.1	3	--[8]	7	3.0	4	--[8]	27	11.5
Private[7]	4,273	73.9	8	0.2	20	0.5	50	1.2	363	8.5
Other[9]	**1,083**	**100.0**	**19**	**1.8**	**71**	**6.6**	**18**	**1.7**	**94**	**8.7**
Public	545	52.5	15	2.8	55	10.1	5	0.9	39	7.2
Medicaid[5]	433	41.7	15	3.5	50	11.5	3	--[8]	29	6.7
Other Public[6]	112	10.8	0	0.0	5	4.5	2	--[8]	10	8.9
Private[7]	465	44.8	3	--[8]	12	2.6	7	1.5	34	7.3

Table 30 (cont'd). Birth Characteristics by Race/Hispanic Ethnicity and Source of Prenatal Care Payment, Massachusetts: 2010

Race/Ethnicity by PNC Payment Source	Prenatal Care: Adequate[10] n	Adequate[10] %	Began 1st Trimester n	Began 1st Trimester %	Cesarean Delivery n	Cesarean Delivery %	Breastfeeding[11] n	Breastfeeding[11] %	Smoking[12] n	Smoking[12] %
STATE TOTAL[4]	**60,782**	**84.9**	**60,346**	**83.9**	**24,244**	**33.3**	**59,580**	**82.9**	**4,579**	**6.3**
Public	19,624	77.5	19,026	74.9	7,717	30.1	19,337	75.4	3,366	13.1
Medicaid[5]	15,111	78.6	14,785	76.6	5,932	30.5	14,408	74.0	2,802	14.4
Other Public[6]	4,513	74.1	4,241	69.4	1,785	28.9	4,929	79.8	564	9.1
Private[7]	39,815	89.6	39,972	89.7	15,879	35.3	39,269	87.3	1,101	2.4
White non-Hispanic	**41,539**	**87.3**	**41,576**	**87.0**	**16,687**	**34.5**	**38,821**	**81.4**	**3,612**	**7.5**
Public	9,314	79.6	9,070	77.2	3,693	31.1	8,129	68.5	2,536	21.4
Medicaid[5]	7,426	80.4	7,241	78.0	2,920	31.1	6,225	66.3	2,178	23.2
Other Public[6]	1,888	76.9	1,829	74.2	773	31.1	1,904	76.6	358	14.4
Private[7]	31,108	90.4	31,378	90.9	12,482	35.8	29,965	85.9	984	2.8
Black non-Hispanic	**5,137**	**76.8**	**5,031**	**75.0**	**2,382**	**35.1**	**5,763**	**85.3**	**345**	**5.1**
Public	2,838	71.9	2,801	70.7	1,342	33.5	3,280	81.8	288	7.2
Medicaid[5]	2,352	75.5	2,345	74.9	1,039	32.9	2,599	82.1	230	7.3
Other Public[6]	486	58.6	456	54.9	303	35.8	681	80.5	58	6.9
Private[7]	2,244	85.8	2,180	83.3	994	37.8	2,403	91.1	47	1.8
Hispanic	**8,274**	**79.0**	**8,043**	**76.6**	**3,033**	**28.7**	**8,778**	**83.3**	**484**	**4.6**
Public	5,885	76.7	5,696	74.0	2,123	27.4	6,287	81.2	443	5.7
Medicaid[5]	3,989	76.5	3,964	75.9	1,522	29.0	4,237	80.7	305	5.8
Other Public[6]	1,896	77.0	1,732	70.0	601	24.1	2,050	82.1	138	5.5
Private[7]	2,311	86.7	2,271	85.1	869	32.4	2,410	89.8	33	1.2
Asian	**4,901**	**85.1**	**4,773**	**82.7**	**1,755**	**30.2**	**5,237**	**90.4**	**78**	**1.3**
Public	1,140	78.8	1,023	70.6	362	24.7	1,152	78.6	50	3.4
Medicaid[5]	980	80.4	880	72.1	300	24.4	961	78.1	46	3.7
Other Public[6]	160	70.2	143	62.4	62	26.4	191	81.3	4	--[8]
Private[7]	3,716	87.6	3,707	87.3	1,370	32.1	4,035	94.4	26	0.6
Other[9]	**889**	**84.2**	**881**	**83.0**	**366**	**33.8**	**938**	**89.6**	**60**	**5.6**
Public	432	80.0	423	78.3	190	34.9	473	86.8	49	9.0
Medicaid[5]	352	82.1	345	80.4	147	33.9	373	86.1	43	9.9
Other Public[6]	80	72.1	78	70.3	43	38.4	100	89.3	6	5.4
Private[7]	413	90.7	415	90.8	163	32.9	434	99.8	16	2.2

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. In the "Births" column, percentages are based on race/ethnicity category totals (in column). For all other characteristics, percentages are based on the total number of births for the race/ethnicity by payment source for the row. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low Birthweight: less than 2,500 grams or 5.5 pounds. 4. Total births do not equal Public + Private because Workers' Compensation, self-paid, and other are in the state total but not shown in the table. 5. Medicaid/MassHealth. 6. Other Public: CommonHealth, Healthy Start, Medicare, other government programs, and free care. 7. Private: commercial indemnity plans or commercial managed care organizations (HMO, PPO, IPP, or IPA). It does not include Self-Paid/Other. 8. Calculations based on values of 1-4 are excluded. 9. Other: Mothers who designated their race as American Indian or "Other." 10. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. 11. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 12. Mother reported smoking during pregnancy.

Table 31. Cesarean Deliveries and Vaginal Births after Cesarean (VBACs) by Licensed Maternity Facility, All Births, Massachusetts: 2010

Facility[1]	Occurrence Births[2]	Total Cesareans		Primary Cesareans[2]		Repeat Cesareans[2]		VBACs[2]	
		N	%[3,4]	N	%[3,5]	N	%[3,6]	N	%[7]
State Total	**73,275**	**24,456**	**33.4**	**14,383**	**23.2**	**10,073**	**90.5**	**1,057**	**9.5**
Anna Jaques Hospital	647	188	29.1	115	20.4	73	88.0	10	12.0
Baystate Franklin Medical Center	465	97	20.9	61	14.7	36	70.6	15	29.4
Baystate Mary Lane Hospital	109	38	34.9	20	22.0	18	100.0	0	0.0
Baystate Medical Center	4,090	1,386	33.9	799	23.4	587	87.6	83	12.4
Berkshire Medical Center	667	217	32.5	120	21.6	97	86.6	15	13.4
Beth Israel Deaconess Medical Center	4,667	1,774	38.0	1,124	28.5	650	89.2	79	10.8
Beverly Hospital	2,024	616	30.5	381	21.7	235	87.7	33	12.3
Boston Medical Center	2,362	710	30.1	424	20.6	286	95.3	14	4.7
Brigham and Women's Hospital	7,884	2,689	34.3	1,738	25.9	951	83.7	185	16.3
Brockton Hospital	972	406	41.8	224	28.9	182	91.9	16	8.1
Cambridge Hospital	1,205	314	26.1	154	15.1	160	85.6	27	14.4
Cape Cod Hospital	862	262	30.4	142	19.4	120	92.3	10	7.7
Caritas Good Samaritan Medical Center	916	367	40.1	217	28.6	150	94.9	8	5.1
Caritas Holy Family Hospital And Medical Center	967	406	42.0	228	28.9	178	99.4	1	--[8]
Caritas Norwood Hospital	479	177	37.0	98	24.8	79	94.0	5	6.0
Caritas St. Elizabeth's Medical Center of Boston	1,024	368	36.0	221	25.8	147	88.0	20	12.0
Charlton Memorial Hospital	1,560	557	35.8	329	24.8	228	99.1	2	--[8]
Cooley Dickinson Hospital	863	254	29.4	153	20.3	101	91.0	10	9.0
Emerson Hospital	1,129	355	31.4	196	20.5	159	91.9	14	8.1
Fairview Hospital	172	69	40.1	40	28.0	29	100.0	0	0.0
Falmouth Hospital	538	200	37.2	104	23.6	96	100.0	0	0.0
Harrington Memorial Hospital	301	108	35.9	57	22.8	51	100.0	0	0.0
HealthAlliance Hospital	1,012	273	27.0	155	17.4	118	96.7	4	--[8]
Heywood Memorial Hospital	478	102	21.3	55	13.0	47	85.5	8	14.5
Holyoke Hospital	521	115	22.1	77	16.3	38	76.0	12	24.0
Jordan Hospital	559	181	32.4	89	19.1	92	100.0	0	0.0
Lawrence General Hospital	1,529	496	32.4	233	18.6	263	95.6	12	4.4
Lowell General Hospital	2,394	836	34.9	490	24.3	346	91.8	31	8.2
Martha's Vineyard Hospital	125	36	28.8	20	18.5	16	94.1	1	--[8]
Massachusetts General Hospital	3,491	1,020	29.2	611	20.2	409	86.5	64	13.5
Melrose-Wakefield Hospital	1,145	493	43.1	297	31.3	196	99.5	1	--[8]
Mercy Medical Center	1,215	325	26.7	207	19.0	118	93.7	8	6.3
Metrowest Medical Center-Framingham Union Campus	1,427	569	39.9	295	25.6	274	100.0	0	0.0
Milford Regional Medical Center	991	347	35.0	204	24.3	143	95.3	7	4.7

Table 31. Cesarean Deliveries and Vaginal Births after Cesarean (VBACs) by Licensed Maternity Facility, All Births, Massachusetts: 2010

Facility[1]	Occurrence Births[2]	Total Cesareans		Primary Cesareans[2]		Repeat Cesareans[2]		VBACs[2]	
		N	%[3,4]	N	%[3,5]	N	%[3,6]	N	%[7]
Morton Hospital	514	181	35.2	110	24.9	71	98.6	1	--[8]
Mount Auburn Hospital	2,260	578	25.6	389	19.3	189	78.4	52	21.6
Nantucket Cottage Hospital	111	30	27.0	19	19.0	11	100.0	0	0.0
Newton Wellesley Hospital	3,692	1,264	34.2	760	24.3	504	90.0	56	10.0
North Adams Regional Hospital	289	74	25.6	38	15.2	36	92.3	3	--[8]
North Shore Medical Center - Salem Hospital	1,480	482	32.6	295	23.1	187	93.0	14	7.0
Saint Vincent Hospital	1,921	556	28.9	314	19.1	242	87.7	34	12.3
South Shore Hospital	3,737	1,605	42.9	912	30.6	693	91.1	68	8.9
St. Luke's Hospital	1,403	513	36.7	290	24.7	223	100.0	0	0.0
Sturdy Memorial Hospital	910	343	37.7	192	25.7	151	92.6	12	7.4
Tobey Hospital	462	114	24.7	67	16.3	47	94.0	3	--[8]
Tufts Medical Center	1,161	452	38.9	302	30.4	150	88.8	19	11.2
UMass Memorial Medical Center - West Campus	3,913	1,151	29.4	567	17.4	584	89.4	69	10.6
Winchester Hospital	2,048	762	37.2	450	26.2	312	94.8	17	5.2

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definitions of occurrence births, primary and repeat Cesarean sections, and VBACs. The percentages provided in this table are based on occurrence births, and may differ from data that are based on resident births presented elsewhere in this book. 3. The percentage of Cesarean births reported is not adjusted for risk factors such as mother's age, birthweight, or complications of labor and delivery, which would influence the number of procedures in a particular facility. Caution should be used when comparing unadjusted percentages. 4. Percentage of total Cesarean = (total Cesarean births/all births) x 100. 5. Percentage primary Cesarean = (primary Cesarean /(all births-repeat Cesarean - VBACs-unknown method of delivery)) x 100. 6. Percentage repeat Cesarean = (repeat Cesarean / (repeat Cesarean + VBACs)) x100. 7. Percentage VBACs= (VBAC deliveries/ (repeat Cesarean + VBAC)) x 100. 8. Calculations based on values of 1-4 are excluded.

Table 32. Cesarean Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2010

	First Birth			Second or Later Birth without prior C-section			Second or Later Birth with prior C-section		
		C-section			C-section			C-section	
Facility[1]	Births[2]	n	%[3]	Births[2]	n	%[3]	Births[2]	n	%[3]
State Total	**32,193**	**9,923**	**30.8**	**26,902**	**2,427**	**9.0**	**10,385**	**9,358**	**90.1**
Anna Jaques Hospital	277	85	30.7	272	22	8.1	81	71	87.7
Baystate Franklin Medical Center	204	49	24.0	206	10	4.9	51	36	70.6
Baystate Mary Lane Hospital	33	14	42.4	54	4	--[4]	18	18	100.0
Baystate Medical Center	1,595	475	29.8	1,616	175	10.8	624	544	87.2
Berkshire Medical Center	288	93	32.3	253	21	8.3	105	90	85.7
Beth Israel Deaconess Medical Center	2,098	730	34.8	1,536	150	9.8	688	610	88.7
Beverly Hospital	896	272	30.4	706	49	6.9	240	207	86.3
Boston Medical Center	964	263	27.3	1,044	130	12.5	284	270	95.1
Brigham and Women's Hospital	3,675	1,076	29.3	2,456	208	8.5	923	755	81.8
Brockton Hospital	394	162	41.1	364	49	13.5	187	172	92.0
Cambridge Hospital	568	130	22.9	438	22	5.0	187	160	85.6
Cape Cod Hospital	383	106	27.7	337	26	7.7	129	119	92.2
Caritas Good Samaritan Medical Center	376	148	39.4	367	57	15.5	149	141	94.6
Caritas Holy Family Hospital and Medical Center	411	167	40.6	363	48	13.2	167	166	99.4
Caritas Norwood Hospital	202	74	36.6	184	17	9.2	81	76	93.8
Caritas St. Elizabeth's Medical Center of Boston	453	153	33.8	354	42	11.9	151	133	88.1
Charlton Memorial Hospital	727	232	31.9	565	66	11.7	222	220	99.1
Cooley Dickinson Hospital	400	122	30.5	339	25	7.4	110	100	90.9
Emerson Hospital	526	154	29.3	408	34	8.3	161	147	91.3
Fairview Hospital	80	34	42.5	61	4	--[4]	28	28	100.0
Falmouth Hospital	243	75	30.9	188	22	11.7	93	93	100.0
Harrington Memorial Hospital	120	47	39.2	124	8	6.5	51	51	100.0
HealthAlliance Hospital	427	101	23.7	453	47	10.4	120	116	96.7
Heywood Memorial Hospital	230	44	19.1	191	11	5.8	51	45	88.2
Holyoke Hospital	230	46	20.0	227	25	11.0	50	38	76.0
Jordan Hospital	229	70	30.6	229	13	5.7	92	92	100.0
Lawrence General Hospital	586	146	24.9	630	53	8.4	261	249	95.4
Lowell General Hospital	1,047	352	33.6	902	96	10.6	368	338	91.8
Martha's Vineyard Hospital	63	17	27.0	45	3	--[4]	16	15	93.8
Massachusetts General Hospital	1,585	421	26.6	1,249	82	6.6	454	390	85.9
Melrose-Wakefield Hospital	542	230	42.4	374	51	13.6	193	192	99.5

Table 32. Cesarean Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2010

	First Birth			Second or Later Birth without prior C-section			Second or Later Birth with prior C-section		
		C-section			C-section			C-section	
Facility[1]	Births[2]	n	%[3]	Births[2]	n	%[3]	Births[2]	n	%[3]
Mercy Medical Center	495	149	30.1	574	46	8.0	122	114	93.4
Metrowest Medical Center-Framingham Union Campus	625	230	36.8	492	38	7.7	260	260	100.0
Milford Regional Medical Center	434	148	34.1	373	33	8.8	148	141	95.3
Morton Hospital	261	86	33.0	175	20	11.4	72	71	98.6
Mount Auburn Hospital	1,197	302	25.2	765	50	6.5	229	177	77.3
Nantucket Cottage Hospital	46	16	34.8	54	3	--[4]	11	11	100.0
Newton Wellesley Hospital	1,669	540	32.4	1,275	98	7.7	533	477	89.5
North Adams Regional Hospital	118	27	22.9	130	9	6.9	36	33	91.7
North Shore Medical Center - Salem Hospital	643	201	31.3	594	67	11.3	188	174	92.6
Saint Vincent Hospital	829	233	28.1	769	54	7.0	255	221	86.7
South Shore Hospital	1,642	637	38.8	1,167	124	10.6	704	636	90.3
St. Luke's Hospital	622	216	34.7	535	61	11.4	218	218	100.0
Sturdy Memorial Hospital	380	145	38.2	350	39	11.1	155	143	92.3
Tobey Hospital	202	37	18.3	192	13	6.8	48	45	93.8
Tufts Medical Center	496	157	31.7	370	70	18.9	150	131	87.3
UMass Memorial Medical Center - West Campus	1,613	406	25.2	1,492	76	5.1	597	528	88.4
Winchester Hospital	900	305	33.9	706	56	7.9	313	296	94.6

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definitions of occurrence births. 3. The percentage of Cesarean births reported is not adjusted for risk factors such as mother's age, birthweight, or complications of labor and delivery, which would influence the number of procedures in a particular facility. Caution should be used when comparing unadjusted percentages. 4. Calculations based on 1-4 events are excluded.

Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2010

Community	Occurrence Births[1]	Resident Births[2]	Low Birthweight[3]	Teen Births 15-19 yr	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
STATE TOTAL	**73,275**	**72,835**	**5,650**	**3,907**	**319**	**238**	**332**
ABINGTON	0	194	12	--[7]	2	2	--[7]
ACTON	1	179	12	--[7]	1	1	0
ACUSHNET	0	82	--[7]	5	0	0	--[7]
ADAMS	0	87	--[7]	5	0	0	0
AGAWAM	0	274	18	7	1	1	--[7]
ALFORD	0	1	0	0	0	0	0
AMESBURY	0	205	7	8	1	1	0
AMHERST	5	156	7	--[7]	0	0	--[7]
ANDOVER	1	230	11	6	2	1	--[7]
ARLINGTON	6	617	44	--[7]	4	3	--[7]
ASHBURNHAM	1	56	--[7]	--[7]	0	0	0
ASHBY	1	19	5	0	1	1	0
ASHFIELD	0	9	0	0	0	0	0
ASHLAND	0	243	22	--[7]	0	0	0
ATHOL	0	132	6	12	1	0	0
ATTLEBORO	912	524	33	29	3	2	--[7]
AUBURN	0	160	10	9	0	0	--[7]
AVON	0	43	6	-[7]	0	0	--[7]
AYER	0	109	9	--[7]	3	3	0
BARNSTABLE	865	403	25	24	3	2	--[7]
BARRE	0	45	--[7]	--[7]	1	1	0
BECKET	1	23	--[7]	--[7]	2	2	0
BEDFORD	0	121	15	--[7]	0	0	0
BELCHERTOWN	3	147	14	--[7]	1	1	0
BELLINGHAM	1	187	11	--[7]	0	0	0
BELMONT	1	294	16	0	0	0	--[7]
BERKLEY	0	65	6	--[7]	0	0	0
BERLIN	0	28	--[7]	0	0	0	0
BERNARDSTON	0	11	--[7]	0	0	0	--[7]
BEVERLY	2,134	397	21	--[7]	0	0	--[7]
BILLERICA	0	463	29	7	0	0	--[7]
BLACKSTONE	0	102	8	7	0	0	0
BLANDFORD	0	6	0	--[7]	0	0	0
BOLTON	0	40	--[7]	--[7]	0	0	0
BOSTON	20,626	7,815	735	503	29	26	41
BOURNE	0	169	--[7]	11	1	1	0
BOXBOROUGH	0	38	--[7]	--[7]	0	0	0
BOXFORD	0	42	11	0	0	0	0
BOYLSTON	0	31	--[7]	--[7]	0	0	0
BRAINTREE	0	373	21	--[7]	2	2	--[7]
BREWSTER	0	65	--[7]	5	0	0	0
BRIDGEWATER	0	218	20	9	0	0	--[7]
BRIMFIELD	1	28	--[7]	--[7]	1	0	--[7]
BROCKTON	1,895	1,416	125	119	10	7	14

Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2010

Community	Occurrence Births[1]	Resident Births[2]	Low Birthweight[3]	Teen Births 15-19 yr	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
BROOKFIELD	0	39	--[7]	--[7]	1	1	--[7]
BROOKLINE	3	693	47	--[7]	1	1	0
BUCKLAND	0	21	--[7]	0	0	0	0
BURLINGTON	1	311	26	--[7]	1	1	0
CAMBRIDGE	3,602	1,223	89	15	2	2	6
CANTON	1	206	18	--[7]	0	0	--[7]
CARLISLE	1	33	--[7]	0	0	0	--[7]
CARVER	1	97	6	--[7]	0	0	0
CHARLEMONT	0	9	0	0	0	0	0
CHARLTON	4	116	8	7	0	0	0
CHATHAM	0	30	0	0	0	0	0
CHELMSFORD	3	320	23	6	2	2	--[7]
CHELSEA	1	656	49	62	3	3	6
CHESHIRE	0	27	6	0	0	0	0
CHESTER	0	10	--[7]	0	0	0	0
CHESTERFIELD	0	3	0	--[7]	0	0	0
CHICOPEE	5	622	41	52	1	0	--[7]
CHILMARK	3	3	0	0	0	0	--[7]
CLARKSBURG	0	10	--[7]	0	0	0	--[7]
CLINTON	1	194	11	16	1	1	--[7]
COHASSET	0	60	--[7]	0	1	1	--[7]
COLRAIN	0	20	--[7]	--[7]	0	0	0
CONCORD	1,131	109	6	0	0	0	0
CONWAY	0	14	0	0	0	0	0
CUMMINGTON	1	6	--[7]	0	0	0	0
DALTON	0	50	--[7]	--[7]	0	0	0
DANVERS	0	223	29	--[7]	0	0	--[7]
DARTMOUTH	0	188	19	8	1	1	--[7]
DEDHAM	1	263	23	--[7]	1	1	0
DEERFIELD	2	39	5	--[7]	0	0	0
DENNIS	1	116	7	12	1	1	0
DIGHTON	0	55	6	--[7]	0	0	0
DOUGLAS	1	103	13	--[7]	2	1	0
DOVER	0	39	--[7]	0	1	0	0
DRACUT	0	322	28	9	4	3	--[7]
DUDLEY	1	100	9	8	2	1	0
DUNSTABLE	0	10	--[7]	0	0	0	0
DUXBURY	0	93	6	0	0	0	--[7]
EAST BRIDGEWATER	1	131	11	7	0	0	0
EAST BROOKFIELD	0	23	0	--[7]	0	0	0
EAST LONGMEADOW	0	122	7	--[7]	0	0	--[7]
EASTHAM	0	30	0	--[7]	0	0	0
EASTHAMPTON	3	166	13	--[7]	1	1	--[7]
EASTON	0	211	19	--[7]	0	0	--[7]
EDGARTOWN	1	41	5	0	0	0	--[7]

Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2010

Community	Occurrence Births[1]	Resident Births[2]	Low Birthweight[3]	Teen Births 15-19 yr	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
EGREMONT	0	5	0	0	0	0	0
ERVING	0	16	0	--[7]	0	0	0
ESSEX	1	31	0	0	0	0	--[7]
EVERETT	1	629	42	32	1	0	6
FAIRHAVEN	0	129	10	12	0	0	--[7]
FALL RIVER	1,563	1,155	101	124	6	6	--[7]
FALMOUTH	541	255	27	12	2	2	--[7]
FITCHBURG	0	545	52	58	5	4	--[7]
FLORIDA	0	8	0	--[7]	0	0	0
FOXBOROUGH	1	164	14	--[7]	1	1	0
FRAMINGHAM	1,430	963	102	52	5	4	--[7]
FRANKLIN	1	284	13	7	0	0	--[7]
FREETOWN	0	86	--[7]	5	0	0	--[7]
GARDNER	479	232	19	26	2	1	--[7]
GAY HEAD	0	4	0	0	0	0	0
GEORGETOWN	0	70	--[7]	0	0	0	0
GILL	1	11	0	--[7]	0	0	0
GLOUCESTER	0	267	14	16	3	2	--[7]
GOSHEN	0	11	0	0	0	0	0
GOSNOLD	0	0	0	0	0	0	0
GRAFTON	1	222	16	--[7]	4	3	--[7]
GRANBY	0	42	--[7]	--[7]	0	0	0
GRANVILLE	0	11	--	0	0	0	0
GREAT BARRINGTON	172	49	--[7]	5	0	0	0
GREENFIELD	473	173	11	9	4	1	--[7]
GROTON	1	73	10	--[7]	0	0	0
GROVELAND	0	48	--[7]	--[7]	0	0	0
HADLEY	0	27	--[7]	0	0	0	0
HALIFAX	1	78	6	--[7]	1	1	0
HAMILTON	1	89	6	0	0	0	--[7]
HAMPDEN	0	40	--[7]	--[7]	0	0	0
HANCOCK	0	3	0	0	0	0	0
HANOVER	0	121	10	0	1	1	0
HANSON	0	105	11	0	0	0	--[7]
HARDWICK	0	25	--[7]	--[7]	0	0	0
HARVARD	0	21	0	0	0	0	0
HARWICH	0	94	8	8	0	0	--[7]
HATFIELD	0	23	--[7]	0	0	0	0
HAVERHILL	0	826	70	56	4	2	--[7]
HAWLEY	0	1	0	0	0	0	0
HEATH	0	7	--[7]	--[7]	0	0	0
HINGHAM	1	198	7	--[7]	0	0	0
HINSDALE	0	16	0	--[7]	0	0	0
HOLBROOK	0	138	7	5	0	0	--[7]
HOLDEN	1	162	16	--[7]	2	2	0

Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2010

Community	Occurrence Births[1]	Resident Births[2]	Low Birthweight[3]	Teen Births 15-19 yr	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
HOLLAND	0	23	--[7]	--[7]	0	0	0
HOLLISTON	1	135	7	--[7]	0	0	0
HOLYOKE	522	606	57	126	2	2	6
HOPEDALE	0	61	--[7]	--[7]	0	0	--[7]
HOPKINTON	0	119	8	0	0	0	0
HUBBARDSTON	0	22	0	0	1	1	--[7]
HUDSON	0	224	29	--[7]	3	3	5
HULL	0	78	--[7]	--[7]	0	0	0
HUNTINGTON	0	25	--[7]	--[7]	0	0	0
IPSWICH	0	103	8	--[7]	0	0	0
KINGSTON	1	113	12	--[7]	2	2	0
LAKEVILLE	0	85	--[7]	--[7]	0	0	0
LANCASTER	2	60	8	--[7]	1	0	--[7]
LANESBOROUGH	0	30	--[7]	--[7]	0	0	--[7]
LAWRENCE	1,529	1,371	96	193	8	5	--[7]
LEE	2	52	--[7]	--[7]	0	0	0
LEICESTER	0	98	10	--[7]	1	1	0
LENOX	0	32	--[7]	--[7]	0	0	0
LEOMINSTER	1,016	462	42	34	5	2	--[7]
LEVERETT	0	7	0	0	0	0	0
LEXINGTON	0	203	16	--[7]	0	0	0
LEYDEN	0	7	--[7]	0	0	0	0
LINCOLN	2	72	--[7]	0	0	0	0
LITTLETON	0	85	7	--[7]	0	0	0
LONGMEADOW	0	86	8	--[7]	1	0	0
LOWELL	2,400	1,678	152	184	15	12	12
LUDLOW	1	148	10	8	2	1	0
LUNENBURG	0	76	--[7]	--[7]	0	0	0
LYNN	6	1,443	111	149	7	4	--[7]
LYNNFIELD	0	72	0	0	0	0	0
MALDEN	2	920	76	17	4	2	--[7]
MANCHESTER	0	30	--[7]	--[7]	0	0	0
MANSFIELD	0	211	19	--[7]	0	0	0
MARBLEHEAD	1	157	13	--[7]	0	0	0
MARION	0	41	0	--[7]	0	0	0
MARLBOROUGH	2	512	39	23	0	0	0
MARSHFIELD	0	224	12	6	0	0	--[7]
MASHPEE	0	125	10	5	1	0	0
MATTAPOISETT	0	36	--[7]	--[7]	0	0	0
MAYNARD	2	126	--[7]	--[7]	0	0	0
MEDFIELD	0	104	11	--[7]	1	1	0
MEDFORD	2	733	56	14	3	3	--[7]
MEDWAY	0	120	9	--	1	1	0
MELROSE	1,146	331	30	0	0	0	0
MENDON	2	43	--[7]	0	0	0	0

Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2010

Community	Occurrence Births[1]	Resident Births[2]	Low Birthweight[3]	Teen Births 15-19 yr	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
MERRIMAC	0	36	--[7]	0	0	0	0
METHUEN	967	564	39	26	1	0	--[7]
MIDDLEBOROUGH	0	235	13	15	2	2	0
MIDDLEFIELD	0	3	0	0	0	0	0
MIDDLETON	0	58	--[7]	--[7]	1	1	0
MILFORD	993	376	17	11	0	0	--[7]
MILLBURY	0	123	--[7]	6	1	1	--[7]
MILLIS	2	74	0	--[7]	0	0	--[7]
MILLVILLE	0	37	--	--[7]	1	0	0
MILTON	0	258	13	--[7]	0	0	--[7]
MONROE	0	0	0	0	0	0	0
MONSON	0	64	--[7]	--[7]	0	0	0
MONTAGUE	1	97	--[7]	8	0	0	0
MONTEREY	0	5	--[7]	0	0	0	0
MONTGOMERY	0	5	0	0	0	0	0
MOUNT WASHINGTON	0	0	0	0	0	0	0
NAHANT	0	25	8	--[7]	0	0	0
NANTUCKET	112	150	15	--[7]	1	1	--[7]
NATICK	4	408	28	--[7]	2	1	--[7]
NEEDHAM	3	267	17	--[7]	1	0	0
NEW ASHFORD	0	6	0	0	0	0	0
NEW BEDFORD	1,407	1,282	97	144	2	2	6
NEW BRAINTREE	0	5	--[7]	0	0	0	0
NEW MARLBOROUGH	0	10	0	0	0	0	0
NEW SALEM	0	6	0	0	0	0	0
NEWBURY	0	34	--[7]	0	0	0	0
NEWBURYPORT	648	136	7	--[7]	1	0	0
NEWTON	3,696	787	55	7	2	2	0
NORFOLK	1	91	--[7]	0	0	0	0
NORTH ADAMS	290	129	8	17	0	0	--[7]
NORTH ANDOVER	0	299	16	7	0	0	--[7]
NORTH ATTLEBORO	2	334	27	6	1	0	--[7]
NORTH BROOKFIELD	0	42	--[7]	--[7]	0	0	0
NORTH READING	0	150	11	--[7]	1	1	--[7]
NORTHAMPTON	878	201	15	6	2	1	0
NORTHBOROUGH	0	121	14	--[7]	0	0	0
NORTHBRIDGE	1	178	9	7	1	1	0
NORTHFIELD	0	27	--[7]	--[7]	0	0	0
NORTON	0	148	11	--[7]	1	1	--[7]
NORWELL	0	80	5	0	1	1	0
NORWOOD	481	382	31	--[7]	0	0	0
OAK BLUFFS	125	47	--[7]	0	0	0	0
OAKHAM	0	14	0	0	0	0	0
ORANGE	3	78	6	12	0	0	0
ORLEANS	1	23	0	0	0	0	0

Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2010

Community	Occurrence Births[1]	Resident Births[2]	Low Birthweight[3]	Teen Births 15-19 yr	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
OTIS	0	10	--[7]	--[7]	0	0	0
OXFORD	1	118	8	8	0	0	0
PALMER	1	118	12	10	0	0	0
PAXTON	1	37	--[7]	--[7]	1	0	0
PEABODY	1	489	27	17	1	1	6
PELHAM	1	13	0	0	0	0	0
PEMBROKE	0	172	7	5	0	0	--[7]
PEPPERELL	1	100	8	5	0	0	0
PERU	0	6	0	0	0	0	0
PETERSHAM	0	10	--[7]	0	0	0	0
PHILLIPSTON	0	6	0	0	0	0	0
PITTSFIELD	672	510	47	46	6	4	--[7]
PLAINFIELD	0	4	0	0	0	0	0
PLAINVILLE	1	103	--[7]	--[7]	0	0	--[7]
PLYMOUTH	563	560	36	26	1	1	--[7]
PLYMPTON	0	22	--[7]	--[7]	0	0	0
PRINCETON	2	24	--[7]	0	0	0	0
PROVINCETOWN	0	18	--[7]	0	0	0	0
QUINCY	3	1213	77	31	4	4	9
RANDOLPH	2	388	45	15	1	1	5
RAYNHAM	1	161	20	6	0	0	--[7]
READING	0	236	17	--[7]	0	0	--[7]
REHOBOTH	0	77	9	--[7]	2	1	0
REVERE	3	754	64	37	2	2	8
RICHMOND	0	5	0	--[7]	0	0	0
ROCHESTER	0	40	5	--[7]	0	0	0
ROCKLAND	0	225	25	10	1	1	--[7]
ROCKPORT	0	38	--[7]	--[7]	0	0	0
ROWE	0	3	0	0	0	0	0
ROWLEY	0	49	0	--[7]	0	0	0
ROYALSTON	0	12	0	--[7]	0	0	0
RUSSELL	0	24	0	0	0	0	0
RUTLAND	0	88	5	--[7]	0	0	0
SALEM	1,483	481	37	29	1	1	--[7]
SALISBURY	0	73	8	--[7]	1	1	0
SANDISFIELD	0	5	0	0	0	0	0
SANDWICH	0	145	9	5	0	0	0
SAUGUS	0	253	12	8	0	0	0
SAVOY	0	7	0	0	0	0	0
SCITUATE	1	140	--[7]	0	0	0	0
SEEKONK	0	98	--[7]	-[7]-	0	0	0
SHARON	2	125	11	0	0	0	0
SHEFFIELD	0	27	--[7]	--[7]	0	0	--[7]
SHELBURNE	0	18	--[7]	--[7]	0	0	0
SHERBORN	0	32	6	0	0	0	0

Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2010

Community	Occurrence Births[1]	Resident Births[2]	Low Birthweight[3]	Teen Births 15-19 yr	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
SHIRLEY	0	71	6	--[7]	2	2	0
SHREWSBURY	3	332	21	--[7]	5	5	--[7]
SHUTESBURY	2	14	0	0	0	0	0
SOMERSET	0	148	10	9	0	0	0
SOMERVILLE	3	938	75	30	2	2	--[7]
SOUTH HADLEY	0	139	11	--[7]	1	0	0
SOUTHAMPTON	0	37	--[7]	--[7]	0	0	0
SOUTHBOROUGH	1	95	--[7]	0	0	0	0
SOUTHBRIDGE	302	211	15	28	0	0	--[7]
SOUTHWICK	0	75	--[7]	--[7]	0	0	0
SPENCER	0	124	14	10	0	0	0
SPRINGFIELD	5,317	2,273	222	371	21	9	9
STERLING	0	67	--[7]	--[7]	0	0	0
STOCKBRIDGE	1	8	0	0	0	0	0
STONEHAM	1	228	14	0	1	0	--[7]
STOUGHTON	0	270	23	8	2	2	--[7]
STOW	1	64	9	--[7]	0	0	0
STURBRIDGE	1	78	--[7]	--[7]	1	0	0
SUDBURY	1	138	12	0	0	0	0
SUNDERLAND	1	28	0	0	0	0	0
SUTTON	3	65	--[7]	--[7]	0	0	--[7]
SWAMPSCOTT	1	125	10	0	1	1	--[7]
SWANSEA	0	112	8	--[7]	0	0	0
TAUNTON	515	692	64	49	2	2	5
TEMPLETON	1	79	6	--[7]	0	0	--[7]
TEWKSBURY	0	264	21	7	2	2	--[7]
TISBURY	0	37	--[7]	0	0	0	0
TOLLAND	0	1	0	0	0	0	0
TOPSFIELD	0	39	0	--[7]	0	0	0
TOWNSEND	0	87	--[7]	6	0	0	0
TRURO	0	12	0	0	0	0	0
TYNGSBOROUGH	0	128	12	7	2	2	0
TYRINGHAM	0	2	0	0	0	0	0
UPTON	0	70	7	0	0	0	0
UXBRIDGE	2	138	11	--[7]	0	0	0
WAKEFIELD	0	313	33	9	0	0	0
WALES	0	15	--[7]	0	0	0	0
WALPOLE	1	237	11	--[7]	0	0	0
WALTHAM	4	794	55	17	2	2	--[7]
WARE	111	115	10	6	1	0	--[7]
WAREHAM	463	215	11	11	3	0	--[7]
WARREN	1	49	--[7]	--[7]	1	1	0
WARWICK	0	3	--[7]	--[7]	0	0	0
WASHINGTON	0	4	--[7]	0	0	0	0
WATERTOWN	2	477	28	--[7]	3	3	--[7]

Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2010

Community	Occurrence Births[1]	Resident Births[2]	Low Birthweight[3]	Teen Births 15-19 yr	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
WAYLAND	1	99	--[7]	--[7]	0	0	0
WEBSTER	0	188	15	16	0	0	0
WELLESLEY	1	241	15	0	2	2	--[7]
WELLFLEET	1	18	--[7]	0	0	0	0
WENDELL	0	5	0	0	0	0	0
WENHAM	1	23	0	0	0	0	0
WEST BOYLSTON	0	52	6	0	0	0	0
WEST BRIDGEWATER	0	78	10	--[7]	0	0	0
WEST BROOKFIELD	0	35	--[7]	--[7]	0	0	0
WEST NEWBURY	0	22	--[7]	--[7]	0	0	0
WEST SPRINGFIELD	1	368	37	24	2	2	0
WEST STOCKBRIDGE	0	11	--[7]	0	0	0	0
WEST TISBURY	0	27	--[7]	0	0	0	0
WESTBOROUGH	0	187	13	--[7]	0	0	--[7]
WESTFIELD	0	403	20	22	2	2	--[7]
WESTFORD	2	179	11	--[7]	0	0	--[7]
WESTHAMPTON	1	14	--[7]	0	0	0	0
WESTMINSTER	0	52	8	--[7]	0	0	0
WESTON	1	66	--[7]	0	0	0	0
WESTPORT	1	101	9	--[7]	0	0	0
WESTWOOD	0	94	--[7]	--[7]	0	0	0
WEYMOUTH	3,739	622	43	14	2	1	--[7]
WHATELY	0	13	0	0	0	0	0
WHITMAN	0	166	16	5	1	0	--[7]
WILBRAHAM	0	89	6	--[7]	0	0	0
WILLIAMSBURG	2	26	--[7]	--[7]	0	0	0
WILLIAMSTOWN	0	35	--[7]	--[7]	0	0	0
WILMINGTON	0	248	21	--[7]	2	1	--[7]
WINCHENDON	0	106	8	9	1	1	--[7]
WINCHESTER	2,049	214	9	0	1	1	0
WINDSOR	0	1	0	0	0	0	0
WINTHROP	0	169	16	7	0	0	0
WOBURN	3	515	46	10	2	1	0
WORCESTER	5,848	2,477	197	244	14	13	22
WORTHINGTON	0	11	--[7]	0	0	0	0
WRENTHAM	0	79	7	0	1	1	0
YARMOUTH	1	208	22	12	0	0	--[7]

Note that infant deaths are based on the death file as June 27, 2012.
1. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 2. Births to mothers who report their usual place of residence as a particular geographical place (state, or city/town). See Glossary for more details. 3. Less than 2,500 grams (5.5 lbs.). 4. Death of a child whose age is less than one year. 5. Death of a child whose age is less than 28 days. 6. A stillbirth delivered, extracted or expulsed at 20 weeks gestation or more or weighs 350 grams or more. 7. Due to small numbers (n=1-4), exact count not provided.

Table 34. Birth Characteristics: Occurrence and Resident Births and Infant Deaths by County, Massachusetts: 2010

County	Occurrence Births[1]	Resident Births[2]			Deaths		
		Number	Low Birthweight[3]	Teen Births (15-19 years)	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
STATE TOTAL	**73,275**	**72,835**	**5,650**	**3,907**	**319**	**238**	**332**
Barnstable	1,410	1,711	117	95	8	6	9
Berkshire	1,138	1,174	89	95	8	6	6
Bristol	4,401	5,859	479	423	18	15	26
Dukes	129	159	9	0	0	0	--[7]
Essex	6,774	8,348	575	543	32	20	36
Franklin	483	637	36	38	--[7]	--[7]	--[7]
Hampden	5,848	5,411	459	636	33	17	24
Hampshire	1005	1,169	88	32	6	--[7]	--[7]
Middlesex	15,505	17,750	1,395	504	73	60	56
Nantucket	112	150	15	--[7]	--[7]	--[7]	--[7]
Norfolk	4,244	7,118	487	119	22	19	32
Plymouth	2,927	5,161	378	230	25	18	28
Suffolk	20,630	9,394	864	609	34	31	55
Worcester	8,669	8,794	659	580	55	41	48

Note that infant deaths are based on the death file as June 27, 2012.
1. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 2. Births to mothers who report their usual place of residence as a particular geographical place (state, or city/town). See Glossary for more details. 3. Less than 2,500 grams (5.5 lbs.). 4. Death of a child whose age is less than one year. 5. Death of a child whose age is less than 28 days. 6. A stillbirth delivered, extracted or expulsed at 20 weeks gestation or more or weighs 350 grams or more. 7. Due to small numbers (n=1-4), exact count not provided.

Table 35. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Community Health Network Areas (CHNAs), Massachusetts: 2010

Community Health Network Area	Occurrence Births[1]	Resident Births[2]			Deaths		
		Number	LBW[3]	Teen Births (15-19 years)	Infant[4]	Neonatal[5]	Fetal[6]
STATE TOTAL	**73,275**	**72,835**	**5,650**	**3,907**	**319**	**238**	**332**
Community Health Network of Berkshire County	1,138	1,174	89	95	8	6	6
Upper Valley Health Web	483	797	43	51	5	1	--[7]
Partnership for Health in Hampshire County	1,005	1,144	87	30	6	3	--[7]
The Community Health Connection	5,319	3,556	321	426	25	12	11
South County Connects	311	1,189	88	90	6	3	--[7]
Community Partners for Health	1,004	1,764	109	54	5	3	6
Community Health Coalition of Metro West	1,449	4,318	352	105	13	11	11
Common Pathways	5,854	3,694	286	272	28	25	27
CHN of North Central Massachusetts	1,505	2,700	220	175	23	17	13
The Greater Lowell CHNA	2,405	3,364	277	222	25	21	17
The Greater Lawrence CHNA	2,497	2,522	164	234	12	7	11
The Greater Haverhill CHNA	648	1,541	112	74	7	4	--[7]
The North Shore CHN (Beverly/Gloucester Area)	2,137	1,017	52	27	3	2	6
The North Shore CHN (Salem/Lynn Area)	1,492	3,268	247	208	10	7	15
Northwest Suburban Health Alliance	3,188	2,128	165	25	7	5	--[7]
North Suburban Health Alliance	1,152	3,540	279	76	10	6	13
The Greater Cambridge/Somerville CHNA	3,614	3,549	252	53	11	10	14
West Suburban Health Network	3,706	2,551	172	29	9	7	--[7]
Boston Alliance for Community Health	20,633	10,087	911	613	35	32	55
Blue Hills Community Health Alliance	4,230	4,123	279	73	11	10	23
CHN of Holyoke, Chicopee, Ludlow, Westfield	528	1,814	130	210	7	5	12
The Greater Brockton CHNA	1,896	2,865	249	161	15	11	22
South Shore CHN	566	1,810	132	54	6	6	9
The Greater Attleboro-Taunton CHNA	1,430	2,685	215	125	11	8	10
Partners for Healthier Communities	1,564	1,516	128	138	6	6	--[7]
Greater New Bedford CHN	1,870	2,099	150	189	6	3	12
Cape and Islands Health Network	1,651	2,020	141	98	9	7	13

Note that infant deaths are based on the death file as June 27, 2012.

1. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 2. Births to mothers who report their usual place of residence as a particular geographical place (state, city/town). See Glossary for more details. 3. Less than 2,500 grams (5.5 lbs.). 4. Death of a child whose age is less than one year. 5. Death of a child whose age is less than 28 days. 6. A stillbirth delivered, extracted or expulsed at 20 weeks gestation or more or weighs 350 grams or more. 7. Due to small numbers (n=1-4), exact count not provided.

Technical Notes

Data Cautions

Limitations of small numbers:
Cells in some tables in this publication, and particularly those tables specific to individual cities and towns, contain small numbers. Rates and proportions based on fewer than five observations are suppressed, and trends based upon small numbers should be interpreted cautiously.

Differences with previously published data
Numbers and rates in this publication may differ from those in previous reports because of updated birth and death files, or release of the most up-to-date population estimates for a given year (see Population Denominators for details on population files).

Self-reported data
Many statistics reported in this publication, such as maternal smoking, education, and race/ethnicity are *self-reported*, and are subject to the usual limitations of this type of information.

Changes in the Collection of Race/Ethnicity Information

Assignment of an Infant's Race/Ethnicity
Prior to 1989, the race/ethnicity of an infant was assigned by combining information on the race/ethnicity of the mother and the race/ethnicity of the father. Since 1989, Massachusetts has followed the recommendation of the National Center for Health Statistics of classifying births according to the self-reported race/ethnicity of the mother. Therefore, beginning in 1989, the race/ethnicity of an infant is identical to the self-reported race/ethnicity of the infant's mother.

Addition of Information on Hispanic Ethnicity
Beginning in 1986, an identifier for Hispanic ethnicity was added to the birth certificate; in 1989, an identifier for Hispanic ethnicity was added to the death certificate. Prior to these changes, most infants and mothers of Hispanic ethnicity were included with Whites and it was not possible to accurately calculate Hispanic-specific rates of natality and mortality.

Changes in Mother's Ancestry Reporting

The following table is from the Parent Worksheet for the birth certificate, which is the self-reported information we use to report on mother's ancestry.

MOTHER's ANCESTRY Please mark the *one* category that *best describes* the mother's ancestry of ethnic heritage:

HISPANIC/LATINA

1 ☐ Puerto Rican
2 ☐ Dominican
3 ☐ Mexican
4 ☐ Cuban
5 ☐ Colombian
6 ☐ Salvadoran
7 ☐ Other Central American (specify) _____
8 ☐ Other South American (specify) _____
9 ☐ Other Hispanic/Latina (specify):

ASIAN/PACIFIC ISLANDER

10 ☐ Chinese
11 ☐ Vietnamese
12 ☐ Cambodian
13 ☐ Asian Indian
14 ☐ Korean
15 ☐ Filipino
16 ☐ Japanese
17 ☐ Laotian
18 ☐ Pakistani
19 ☐ Thai
20 ☐ Hawaiian
21 ☐ Other Asian/Pacific Islander(specify) _____

PORTUGUESE SPEAKING

22 ☐ Cape Verdean
23 ☐ Brazilian
24 ☐ Other Portuguese (specify): _____

WEST INDIAN/CARIBBEAN ISLANDER

25 ☐ Haitian
26 ☐ Jamaican
27 ☐ Barbadian
28 ☐ OtherWest Indian/Caribbean Islander (specify): _____

AFRICAN/AFRICAN AMERICAN

29 ☐ African-American/ Afro-American
30 ☐ Nigerian
31 ☐ Other African specify): _____

MIDDLE EASTERN

32 ☐ Lebanese
33 ☐ Iranian
34 ☐ Israeli
35 ☐ Other Middle Eastern (specify): _____

AMERICAN ANCESTRY

36 ☐ Native American/ American Indian (specify tribe/affiliation): _____
37 ☐ American

EUROPEAN and OTHER ancestries

38 ☐ European (specify): _____
39 ☐ Other (specify): _____

Beginning in 2006, we eliminated the "Other" categories from the mother's ancestries and used the literal ancestry text to create new categories such as "Honduran" and "Guatemalan," which a large number of mothers wrote in for "Other Hispanic/Latina." In 2006, we reported on groups that had greater than 400 births.

Since 2007, certain ancestry groups were combined to form meta-groups: Lebanese, Iranian, Israeli, and Other Middle Eastern ancestries were combined into "Middle Eastern"; Colombian and Other South American were combined into "South American"; and Nigerian and Other African were combined into "African."

Table 36. 2010 Massachusetts Population Estimates by Age Group, Gender, Race and Hispanic Ethnicity (mutually exclusive)

Age Group	Total[1]	White Non-Hispanic	Black Non-Hispanic	Native American Non-Hispanic	Asian Non-Hispanic	Hispanic[2]
Female						
0 to 4	179,482	118,741	16,565	453	12,811	30,912
5 to 9	189,140	131,837	15,980	493	13,006	27,824
10 to 14	198,194	142,544	16,563	517	11,236	27,334
15 to 19	227,876	162,348	20,188	613	14,050	30,677
20 to 24	239,412	170,675	19,843	586	18,427	29,881
25 to 29	223,270	157,878	17,204	510	19,954	27,724
30 to 34	205,278	143,109	16,316	428	18,675	26,750
35 to 39	214,438	156,175	16,109	424	17,789	23,941
40 to 44	240,302	186,252	16,639	578	14,629	22,204
45 to 49	263,497	213,955	16,358	628	12,722	19,834
50+	1,200,112	1,047,651	57,940	2,195	39,848	52,478
All Females	3,381,001	2,631,165	229,705	7,425	193,147	319,559
Male						
0 to 4	187,605	124,432	17,270	482	13,283	32,138
5 to 9	196,547	137,967	16,635	488	12,556	28,901
10 to 14	207,419	150,342	17,396	547	10,862	28,272
15 to 19	234,880	167,875	21,147	639	13,112	32,107
20 to 24	236,256	168,765	19,528	644	16,477	30,842
25 to 29	218,255	156,053	16,127	514	17,591	27,970
30 to 34	198,338	140,612	15,005	395	16,419	25,907
35 to 39	203,757	149,905	14,524	438	16,711	22,179
40 to 44	228,652	179,096	15,150	532	13,412	20,462
45 to 49	251,937	206,015	15,572	638	12,007	17,705
50+	1,002,982	878,240	46,079	2,011	35,040	41,612
All Males	3,166,628	2,459,302	214,433	7,328	177,470	308,095
State						
0 to 4	367,087	243,173	33,835	935	26,094	63,050
5 to 9	385,687	269,804	32,615	981	25,562	56,725
10 to 14	405,613	292,886	33,959	1,064	22,098	55,606
15 to 19	462,756	330,223	41,335	1,252	27,162	62,784
20 to 24	475,668	339,440	39,371	1,230	34,904	60,723
25 to 29	441,525	313,931	33,331	1,024	37,545	55,694
30 to 34	403,616	283,721	31,321	823	35,094	52,657
35 to 39	418,195	306,080	30,633	862	34,500	46,120
40 to 44	468,954	365,348	31,789	1,110	28,041	42,666
45 to 49	515,434	419,970	31,930	1,266	24,729	37,539
50+	2,203,094	1,925,891	104,019	4,206	74,888	94,090
State Total	6,547,629	5,090,467	444,138	14,753	370,617	627,654

1. National Center for Health Statistics. Estimates of the April 1, 2010 resident population of the United States, by county, single-year of age (0, 1, 2, …, 85 years and over), bridged race, Hispanic origin, and sex. Prepared under a collaborative arrangement with the U.S. Census Bureau; released November 3, 2011. Available from: http://www.cdc.gov/nchs/nvss/bridged_race.htm as of November 17, 2011. 2. Persons of Hispanic ethnicity are NOT included in the race categories. These estimates are used to calculate ***statewide population based rates*** published in this report.

Change in Measurement of Adequacy of Prenatal Care

Change in Adequacy of Prenatal Care Indicator since *Massachusetts Births 2001*:
(This discussion is based on excerpts from "An Overview of the APNCU Index" by Milton Kotelchuck, Sept. 1994, available online at

http://www.mchlibrary.info/databases/HSNRCPDFs/Overview_APCUIndex.pdf. Accessed December 2003).

Beginning with *Massachusetts Births 2001*, adequacy of prenatal care is being measured using a new method. The Adequacy of Prenatal Care Utilization (APNCU) Index, developed by Dr. Milton Kotelchuck, has replaced the Kessner Index, which had been used in the *Advanced Data Births* and *Massachusetts Births* series. The APNCU Index is the standard used in Healthy People 2010 and by the majority of states. It improves upon the Kessner Index in various ways, the most important being the ability to distinguish between inadequate prenatal care due to the timing of initiation and inadequate care due to insufficient prenatal care visits. The APNCU Index also improves upon the Kessner Index by correcting some of its principal faults. First, the APNCU Index more accurately assesses adequacy of visits for term pregnancies; the Kessner Index characterizes 9 or more visits as adequate, due to an early computer database limitation, which only allowed for a single-digit number to record prenatal care visits. Other faults of the Kessner Index include its bias towards measurement of adequacy of initiation of care, and its various computational algorithms due to inadequate initial documentation.

Table 1 of this report provides a comparison of data on adequacy of prenatal care from 1996-2009 as measured by these two separate indices. Below are the definitions for the APNCU Index categories and its two component indices (initiation and received services), and the definition of the Kessner Index categories. Also below is a short summary of the major differences in classification of adequacy of prenatal care using the Kessner Index and the APNCU Index.

The APNCU Index characterizes prenatal care (PNC) utilization by measuring two distinct components of prenatal care -- adequacy of initiation and adequacy of received services (visits). Each of these components is measured as an independent index, and the APNCU Index is a summary of these 2 component indices. As with the Kessner Index, the APNCU Index does not assess quality of the prenatal care that is delivered, only its utilization.

Adequacy of Prenatal Care Utilization (APNCU) Index: Definition of Categories

Category	Month Prenatal Care Began	% of Expected[1] Prenatal Care Visits
Adequate Intensive	1, 2, 3, or 4	110% or more
Adequate Basic	1, 2, 3, or 4	80 – 109%
Intermediate	1, 2, 3, or 4	50 – 79%
Inadequate	Month 5 or later	Less than 50%
Unknown	Prenatal care information not recorded	

[1] The number of "expected" visits is determined based on standards set by the American College of Obstetricians and Gynecologists (ACOG).

Component Indices of the APNCU Index: Definitions of Categories

Component Indices and Summary Index:

The first component index is "Adequacy of Initiation," which describes the adequacy of when prenatal care began during pregnancy. The assumption underlying this scale is that the earlier PNC begins the better. The month or trimester prenatal care begins is widely used as a measure to assess the adequacy of timing of initiation of PNC, since it accurately and succinctly describes when PNC begins. The APNCU Index uses this measure to determine the "adequacy of initiation."

The second component index, "Adequacy of Received Services" (visits), characterizes the adequacy of received PNC visits during the time period after prenatal care is begun until the delivery. This component attempts to characterize if the woman received the appropriate number of prenatal care visits for the time period in which she received PNC services. [The appropriate number of visits is based on recommendations of the American College of Obstetricians and Gynecologists for an uncomplicated pregnancy. For example, a woman beginning prenatal care during the first month of pregnancy who delivers during the 40th week of gestation (and has no complications with her pregnancy) should receive 14 visits].

The two component indices are measured independently from one another, and can be used as separate indices, since the policy and practice issues underlying whether women are beginning care early and whether they are receiving the recommended amount of visits may be quite distinct. However, because of the popularity and utility of using one overall adequacy of PNC index, the two component indices are combined into a single summary index – the "Adequacy of Prenatal Care Utilization (APNCU) Index."

Index Categories

Both component indices and the summary index (APNCU Index) characterize PNC as one of five categories: "adequate intensive," "adequate basic," "intermediate," "inadequate," or "unknown." The category "adequate basic" refers to the minimum recommended level of care (for a pregnancy with no complications), while "adequate intensive" refers to a level of care exceeding recommended standards. The sum of the "adequate basic" and "adequate intensive" categories is the total adequacy score. In addition, the "inadequate" category can be subdivided to isolate those women who received no PNC. [For definitions of categories, please see the Technical Notes in the Appendix.]

[For more detail on the methodology of the APNCU Index, please call the Bureau of Health Information, Statistics, Research & Evaluation at 617-624-5600].

Adequacy of Initiation Index

Category	Month Prenatal Care Began
Adequate Intensive	1 or 2
Adequate Basic	3 or 4
Intermediate	5 or 6
Inadequate	Month 7 or later, or no PNC
Unknown	Prenatal care initiation information not recorded

Adequacy of Received Services (Visits) Index

Category	% of Expected Prenatal Care Visits
Adequate Intensive	110% or more
Adequate Basic	80 – 109%
Intermediate	50 – 79%
Inadequate	Less than 50%
Unknown	Information on prenatal care visits not recorded

Kessner Index of Adequacy of Prenatal Care: Definition of Categories

Category	Trimester Care Began	Number of Visits
Adequate	1	9 or more
Intermediate	1	5-8
	2	5 or more
Inadequate	1	1-4
	2	1-4
	3	1 or more
No prenatal care	--	0
Unknown	Unknown	Unknown

Summary of Major Differences in Categorization of Adequacy of Prenatal Care between the Kessner Index and the APNCU Index

The two different methods used in the Kessner Index and APNCU Index to calculate adequacy of prenatal care can result in differences in how each one classifies adequacy of prenatal care. These differences only occur under certain conditions, not in all cases (see "Explanation" column).

The Kessner Index classifies prenatal care as…	… but the APNCU Index classifies prenatal care as …	Explanation
Intermediate	Adequate Basic	This is primarily due to the fact that the APNCU Index allows for prenatal care in the 4th month of pregnancy to be considered adequate if the mother received 80-109% of expected visits, whereas the Kessner Index only allows for care begun in the first trimester (months 1-3) to be considered adequate.
Intermediate	Inadequate	This is primarily due to the fact that the APNCU requires that the mother must make at least 50% of the "expected visits for a normal pregnancy", i.e., 7 visits, which is 50% of the recommended 14 visits for a normal pregnancy, to be "intermediate", while the Kessner Index allows 5 or 6 visits to meet "intermediate" status if the initiation of PNC is in the second trimester.
Adequate	Intermediate	This is primarily due to the consideration of "expected" visits (based on when the mother initiated care and the length of gestation) using the APNCU Index, which bases expected visits on the ACOG recommendations, which can be as high as 14 visits if a gestational period is 40 weeks, whereas the Kessner Index considers 9 visits sufficient in all cases.
Adequate	Adequate Intensive	The APNCU Index added an "Adequate Intensive" category, which is not used in the Kessner Index. This allows analysis of situations in which more than normal care is received (e.g. women with high-risk conditions, pregnancy complications).

Tests of Statistical Significance

Since the 2005 report, statistics presented in the text section have been tested to determine whether they differ significantly from a target statistic. For example, the number of births in 2010 was compared with the number of births in 2009, to determine whether their difference could have occurred by chance. When a difference is unlikely to have occurred by chance, it is referred to as "significant."

Note that with respect to statistical difference, the language in the reports beginning with 2005 differs from that of past reports, and caution must be used when comparing the text of previous reports with this year's report.

In testing for statistical significance, we have used the testing methods from the National Center for Health Statistics (NCHS). These methods are presented in the following document:

> National Vital Statistics Reports, Volume 52, Number 10
> Births: Final Data for 2002
> by Joyce A. Martin, M.P.H.; Brady E. Hamilton, Ph.D.; Paul D. Sutton, Ph.D.; Stephanie J. Ventura, M.A.; Fay Menacker, Dr. P.H.; and Martha L. Munson, M.S.;
> From the Division of Vital Statistics, NCHS.
> Technical Notes, "Significance testing" section beginning on page 110.

This document is available from the following website:
http://www.cdc.gov/nchs/products/pubs/pubd/nvsr/52/52-23.htm

For comparisons of more than 100 events, whether they are rates, proportions, or numbers, the binomial distribution is assumed, and confidence intervals are examined to see whether they overlap (Refer to the "Confidence Intervals and Infant Mortality Rates" section in this Appendix for an explanation of using confidence intervals to determine statistical significance.) When the number of events is less than 100, a Poisson distribution is assumed, and confidence intervals are constructed based upon the Poisson distribution. For more details and exact formulas for calculating confidence intervals or other tests of statistical significance, refer to the publication listed above.

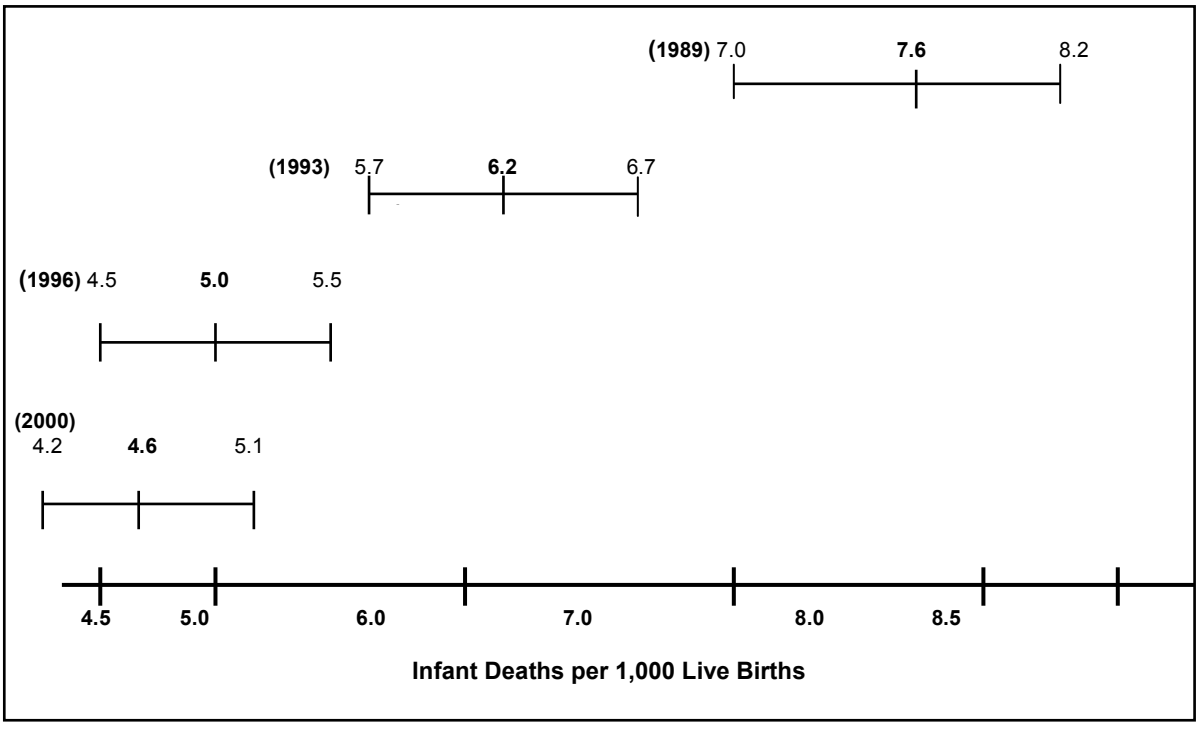
When two statistics are determined to differ significantly, they then are referred to in the text with language expressing differences, such as "higher" and "lower," or "increased" and "decreased". Otherwise, differences that are not significant are reported as having "no change" or "no statistical difference."

Confidence Intervals and Infant Mortality Rates

Beginning with the 1992 Advance Data: Births publication, 95% confidence intervals were added to the calculation of infant mortality rates (IMRs). The confidence interval (CI) provides a measure of stability of the IMR and a basis for comparing rates to determine if they are statistically different. Rates can be compared for the same group in different years or for different groups in the same year. The width of the CI reflects the stability of the IMR. For example, a narrow CI reflects high stability, and a wide interval reflects low stability. If the CIs around two IMRs being compared do not overlap, the difference between the two rates is statistically significant. The following table and chart illustrate the concept of statistically significant differences using actual data from 1989, 1993, 1996, and 2000.

Comparison of Infant Mortality Rates and Confidence Intervals for Selected Years

Year	IMR (per 1,000 births)	95% Confidence Interval
1989	7.6	(7.0-8.2)
1993	6.2	(5.7-6.7)
1996	5.0	(4.5-5.5)
2000	4.6	(4.2-5.1)



The difference between the 1993 IMR and 1996 IMR is statistically significant – the confidence intervals do not overlap. The same is true for the differences between the 1989 IMR and each annual IMR for 1993, 1996, and 2000. However, the difference between the 1996 and 2000 IMRs is not statistically significant, since their confidence intervals overlap.

Table 37. 95% Confidence Intervals for Infant Mortality Rates by Race and Hispanic Ethnicity, Massachusetts: 1990-2010

	Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian	
Year	n	Rate[2] (95% CI)	n	Rate[2] (95% CI)	n	Rate[2] (95% CI)	n	Rate[2] (95% CI)	n	Rate[2] (95% CI)
1990	649	7.0 (6.5, 7.5)	442	6.1 (5.5, 6.7)	98	13.7 (11.0, 16.4)	77	9.1 (7.1, 11.1)	24	7.0 (4.2, 10.0)
1991	577	6.5 (6.0, 7.0)	381	5.5 (4.9, 6.1)	101	15.0 (12.1, 17.9)	80	9.4 (7.3, 11.5)	14	4.2 (2.0, 6.4)
1992	569	6.5 (6.0, 7.0)	371	5.5 (4.9, 6.1)	110	16.4 (13.4, 19.4)	67	7.9 (6.0, 9.8)	16	4.9 (2.5, 7.3)
1993	523	6.2 (5.7, 6.7)	346	5.3 (4.7, 5.9)	84	13.1 (10.3, 15.9)	77	9.3 (7.2, 11.4)	13	3.9 (1.8, 6.0)
1994	499	6.0 (5.4, 6.5)	343	5.3 (4.7, 5.9)	79	12.6 (9.8, 15.4)	64	7.6 (5.7, 9.4)	8	2.4 (0.7, 4.0)
1995	419	5.1 (4.6, 5.6)	275	4.4 (3.8, 4.9)	65	11.1 (8.4, 13.8)	58	7.2 (5.3, 9.0)	19	5.5 (3.0, 8.0)
1996	403	5.0 (4.5, 5.5)	289	4.7 (4.1, 5.2)	63	11.4 (8.6, 14.2)	40	5.1 (3.5, 6.7)	8	2.2 (0.7, 3.7)
1997	425	5.3 (4.8, 5.8)	294	4.8 (4.2, 5.3)	64	11.7 (8.8, 14.5)	55	6.7 (4.9, 8.4)	10	2.6 (1.0, 4.2)
1998	414	5.1 (4.6, 5.6)	294	4.6 (4.1, 5.2)	64	10.6 (7.9, 13.3)	55	6.7 (5.0, 8.4)	10	2.7 (1.0, 4.3)
1999	418	5.2 (4.7, 5.7)	285	4.7 (4.2, 5.3)	72	12.3 (9.5, 15.1)	49	5.5 (4.0, 7.1)	8	1.9 (0.6, 3.3)
2000	377	4.6 (4.2, 5.1)	232	3.8 (3.4, 4.3)	74	12.8 (9.9, 15.7)	48	5.2 (3.7, 6.6)	19	4.1 (2.2, 5.9)
2001	407	5.0 (4.5, 5.5)	245	4.1 (3.6, 4.7)	71	12.1 (9.3, 14.9)	69	7.3 (5.6, 9.1)	15	3.1 (1.6, 4.7)
2002	397	4.9 (4.4, 5.4)	239	4.1 (3.6, 4.6)	69	11.6 (8.9, 14.3)	67	7.0 (5.3, 8.7)	16	3.0 (1.5, 4.5)
2003	383	4.8 (4.3, 5.3)	235	4.1 (3.6, 4.6)	75	12.7 (9.8, 15.5)	55	5.6 (4.1, 7.1)	14	2.7 (1.3, 4.1)
2004	376	4.7 (4.3, 5.3)	210	3.8 (3.3, 4.3)	70	11.5 (8.9, 14.2)	75	7.6 (5.9, 9.4)	15	2.7 (1.4, 4.1)
2005	391	5.1 (4.6, 5.6)	230	4.3 (3.7, 4.9)	57	9.4 (7.0, 11.8)	78	7.8 (6.0, 9.5)	18	3.4 (1.8, 5.0)
2006	369	4.8 (4.3, 5.2)	221	4.2 (3.6, 4.7)	72	11.1 (8.6, 13.7)	62	5.8 (4.4, 7.2)	10	1.8 (0.7, 3.0)
2007	380	4.9 (4.4, 5.4)	206	3.9 (3.4, 4.4)	66	10.2 (7.8, 12.6)	81	7.4 (5.8, 9.1)	18	3.1 (1.7, 4.6)
2008	382	5.0 (4.5, 5.5)	194	3.7 (3.2, 4.3)	78	11.7 (9.1, 14.3)	86	7.9 (6.2, 9.5)	16	2.7 (1.4, 4.0)
2009	363	4.8 (4.3, 5.3)	203	4.1 (3.5, 4.6)	53	7.6 (5.6, 9.7)	78	7.1 (5.5, 8.7)	19	3.2 (1.8, 4.6)
2010	319	4.4 (3.9, 4.9)	163	3.4 (2.8, 3.9)	56	8.2 (6.1, 10.4)	65	6.1 (4.6, 7.6)	25	4.3 (2.6, 6.0)

1. Deaths of infants of unknown race are excluded except for the total calculation. For rate computations, births of infants of unknown race are allocated into the race categories according to the distribution of births of known race. 2. Rates are expressed per 1,000 live births.

In 2010, the Black infant mortality rate was 8.2 deaths per 1,000 live births (95% CI: 6.1, 10.4), which was almost 2.5 times greater than the White infant mortality rate of 3.4 (95% CI: 2.8, 3.9). The difference in these two rates was statistically significant. The rate of infant mortality for Blacks was also significantly elevated compared with Asians (4.3, 95% CI: 2.6, 6.0) in 2010.

Definition of Rates and Ratios

Age-Specific Birth Rate

The number of children born to women in a specific age group divided by the population of women in that specific age group, multiplied by 1,000.

$$\text{Age-Specific Birth Rate} = \frac{\text{Number of births to females ages X to Y years}}{\text{Number of females ages X to Y years in the population}} \times 1{,}000$$

Birth Rate

(See Age-Specific Birth Rate, Crude Birth Rate, Fertility Rate, and Teen Birth Rate)

Cesarean Section Rates

$$\text{Total Cesarean Delivery Rate} = \frac{\text{Number of Cesarean births}}{\text{Number of occurrence births}} \times 100$$

$$\text{Primary Cesarean Delivery Rate} = \frac{\text{Number of primary Cesarean births}}{\text{[Number of occurrence births - number of repeat Cesarean births - VBACs - unknown method of delivery]}} \times 100$$

$$\text{Repeat Cesarean Delivery Rate} = \frac{\text{Number of repeat Cesarean births}}{\text{(Number of repeat Cesarean births+number of VBACs)}} \times 100$$

$$\text{VBAC Rate} = \frac{\text{Number of VBACs}}{\text{(Number of repeat Cesarean births+number of VBACs)}} \times 100$$

Crude Birth Rate

$$\text{Crude Birth Rate} = \frac{\text{Number of resident live births}}{\text{Total resident population}} \times 1{,}000$$

Fertility Rate (sometimes referred to as "Birth Rate")

$$\text{Fertility Rate} = \frac{\text{Number of births to females ages 15-44 years}}{\text{Number of females ages 15-44 years in the population}} \times 1{,}000$$

Fetal Mortality Rate

$$\text{Fetal Mortality Rate} = \frac{\text{Number of fetal deaths}}{\text{Number of fetal deaths plus live births in the same year}} \times 1{,}000$$

Feto-Infant Mortality Rate

ii) Feto-Infant Mortality Rate = $\frac{\text{Number of fetal deaths + Number of infant deaths}}{\text{Number of fetal deaths + live births in the same year}}$ X 1,000

(Refer to the definitions of Fetal Mortality Rate and Infant Mortality Rate for more details.)

Infant Mortality Rate (IMR)
The death rate among infants less than one year old per 1,000 live births.

$$\text{Infant Mortality Rate} = \frac{\text{Number of resident deaths of infants less than one year old in a year}}{\text{Number of resident live births in the same year}} \times 1{,}000$$

Inter-pregnancy Interval (IPI)
Inter-pregnancy interval is the time, in months, between the date of last menstrual period of current pregnancy and the date of previous live birth. IPI is calculated for each mother currently giving birth to their second or later child.

$$\%\text{Short IPI} = \frac{\text{Number of mothers giving birth to their 2nd or later child with IPI <12 months}}{\text{Number of mothers giving birth to their 2nd or later child in the same year}} \times 100$$

$$\%\text{ IPI 12 to 35 months} = \frac{\text{Number of mothers giving birth to their 2nd or later child with IPI between 12 and 35 months}}{\text{Number of mothers giving birth to their 2nd or later child in the same year}} \times 100$$

$$\%\text{ IPI 36+ months} = \frac{\text{Number of mothers giving birth to their 2nd or later child with IPI >=36 months}}{\text{Number of mothers giving birth to their 2nd or later child in the same year}} \times 100$$

Maternal Mortality Ratio (MMR)
The number of maternal deaths per 100,000 live occurrence births. The term "ratio" is used instead of "rate" in this report because the numerator (number of deaths) is not a subset of the denominator (live births). The ideal measure would incorporate the total number of pregnancies not just live births in the denominator. However, pregnancies that result in late fetal death or end in induced terminations are difficult to record, and data are often incomplete. As a result, the population at risk of maternal death is generally taken as the number of live births, which is assumed to be a good proxy for the number of pregnancies.

$$\text{Maternal Mortality Ratio (MMR)} = \frac{\text{Number of maternal deaths}}{\text{Number of occurrence live births in the same year}} \times 100{,}000$$

Neonatal Mortality Rate (NMR)
The death rate among infants less than 28 days of age per 1,000 live births.

$$\text{Neonatal Mortality Rate} = \frac{\text{Number of resident deaths of infants less than 28 days of age in a year}}{\text{Number of resident live births in the same year}} \times 1{,}000$$

Perinatal Mortality Rate

$$\text{Perinatal Mortality Rate} = \frac{\text{Number of fetal deaths from 28 weeks gestation plus infant deaths (less than 7 days old)}}{\text{Number of fetal deaths plus live births in the same year}} \times 1{,}000$$

Post Neonatal Mortality Rate
The death rate among infants 28 days of age to less than one year old per 1,000 live births.

$$\text{Post Neonatal Mortality Rate} = \frac{\text{Number of resident deaths of infants 28 days of age to less than one year of age in a year}}{\text{Number of resident live births in the same year}} \times 1{,}000$$

Pregnancy-Associated Mortality Ratio (PAMR)
The number of pregnancy-associated deaths per 100,000 live occurrence births. The term "ratio" is used instead of rate in this report because the numerator includes some maternal deaths that were not related to live-born infants and thus were not included in the denominator.

$$\text{Pregnancy-Associated Mortality Ratio (PAMR)} = \frac{\text{Number of pregnancy-associated deaths}}{\text{Number of occurrence live births in the same year}} \times 100{,}000$$

Teen Birth Rate

$$\text{Teen birth rate} = \frac{\text{Number of births to females ages 15-19 years old}}{\text{Number of females ages 15-19 years old in the population}} \times 1{,}000$$

Total Rate of Change
Total rate of change between two numbers or rates is expressed as a percentage in this report (e.g. The Massachusetts birth rate decreased by 12% from 1990 to 1996.):

$$\frac{Pn-Po}{Po} \times 100$$

where, Pn = rate during later time period
Po = rate during earlier time period

Table A1. Population Estimates[1] for Massachusetts Communities, 2010

TOWN NAME	COUNTY	CHNA	POPULATION	TOWN NAME	COUNTY	CHNA	POPULATION
Abington	Plymouth	22	15,985	Concord	Middlesex	15	17,668
Acton	Middlesex	15	21,924	Conway	Franklin	2	1,897
Acushnet	Bristol	26	10,303	Cummington	Hampshire	3	872
Adams	Berkshire	1	8,485	Dalton	Berkshire	1	6,756
Agawam	Hampden	4	28,438	Danvers	Essex	14	26,493
Alford	Berkshire	1	494	Dartmouth	Bristol	26	34,032
Amesbury	Essex	12	16,283	Dedham	Norfolk	18	24,729
Amherst	Hampshire	3	37,819	Deerfield	Franklin	2	5,125
Andover	Essex	11	33,201	Dennis	Barnstable	27	14,207
Aquinnah (Gay Head)	Dukes	27	311	Dighton	Bristol	24	7,086
Arlington	Middlesex	17	42,844	Douglas	Worcester	6	8,471
Ashburnham	Worcester	9	6,081	Dover	Norfolk	18	5,589
Ashby	Middlesex	9	3,074	Dracut	Middlesex	10	29,457
Ashfield	Franklin	2	1,737	Dudley	Worcester	5	11,390
Ashland	Middlesex	7	16,593	Dunstable	Middlesex	10	3,179
Athol	Worcester	2	11,584	Duxbury	Plymouth	23	15,059
Attleboro	Bristol	24	43,593	East Bridgewater	Plymouth	22	13,794
Auburn	Worcester	8	16,188	East Brookfield	Worcester	5	2,183
Avon	Norfolk	22	4,356	East Longmeadow	Hampden	4	15,720
Ayer	Middlesex	9	7,427	Eastham	Barnstable	27	4,956
Barnstable	Barnstable	27	45,193	Easthampton	Hampshire	3	16,053
Barre	Worcester	9	5,398	Easton	Bristol	22	23,112
Becket	Berkshire	1	1,779	Edgartown	Dukes	27	4,067
Bedford	Middlesex	15	13,320	Egremont	Berkshire	1	1,225
Belchertown	Hampshire	3	14,649	Erving	Franklin	2	1,800
Bellingham	Norfolk	6	16,332	Essex	Essex	13	3,504
Belmont	Middlesex	17	24,729	Everett	Middlesex	16	41,667
Berkley	Bristol	24	6,411	Fairhaven	Bristol	26	15,873
Berlin	Worcester	9	2,866	Fall River	Bristol	25	88,857
Bernardston	Franklin	2	2,129	Falmouth	Barnstable	27	31,531
Beverly	Essex	13	39,502	Fitchburg	Worcester	9	40,318
Billerica	Middlesex	10	40,243	Florida	Berkshire	1	752
Blackstone	Worcester	6	9,026	Foxborough	Norfolk	7	16,865
Blandford	Hampden	4	1,233	Framingham	Middlesex	7	68,318
Bolton	Worcester	9	4,897	Franklin	Norfolk	6	31,635
Boston	Suffolk	19	617,594	Freetown	Bristol	26	8,870
Bourne	Barnstable	27	19,754	Gardner	Worcester	9	20,228
Boxborough	Middlesex	15	4,996	Georgetown	Essex	12	8,183
Boxford	Essex	12	7,965	Gill	Franklin	2	1,500
Boylston	Worcester	8	4,355	Gloucester	Essex	13	28,789
Braintree	Norfolk	20	35,744	Goshen	Hampshire	3	1,054
Brewster	Barnstable	27	9,820	Gosnold	Dukes	27	75
Bridgewater	Plymouth	22	26,563	Grafton	Worcester	8	17,765
Brimfield	Hampden	5	3,609	Granby	Hampshire	3	6,240
Brockton	Plymouth	22	93,810	Granville	Hampden	4	1,566
Brookfield	Worcester	5	3,390	Great Barrington	Berkshire	1	7,104
Brookline	Norfolk	19	58,732	Greenfield	Franklin	2	17,456
Buckland	Franklin	2	1,902	Groton	Middlesex	9	10,646
Burlington	Middlesex	15	24,498	Groveland	Essex	12	6,459
Cambridge	Middlesex	17	105,162	Hadley	Hampshire	3	5,250
Canton	Norfolk	20	21,561	Halifax	Plymouth	23	7,518
Carlisle	Middlesex	15	4,852	Hamilton	Essex	13	7,764
Carver	Plymouth	23	11,509	Hampden	Hampden	4	5,139
Charlemont	Franklin	2	1,266	Hancock	Berkshire	1	717
Charlton	Worcester	5	12,981	Hanover	Plymouth	23	13,879
Chatham	Barnstable	27	6,125	Hanson	Plymouth	23	10,209
Chelmsford	Middlesex	10	33,802	Hardwick	Worcester	9	2,990
Chelsea	Suffolk	19	35,177	Harvard	Worcester	9	6,520
Cheshire	Berkshire	1	3,235	Harwich	Barnstable	27	12,243
Chester	Hampden	21	1,337	Hatfield	Hampshire	3	3,279
Chesterfield	Hampshire	3	1,222	Haverhill	Essex	12	60,879
Chicopee	Hampden	21	55,298	Hawley	Franklin	2	337
Chilmark	Dukes	27	866	Heath	Franklin	2	706
Clarksburg	Berkshire	1	1,702	Hingham	Plymouth	20	22,157
Clinton	Worcester	9	13,606	Hinsdale	Berkshire	1	2,032
Cohasset	Norfolk	20	7,542	Holbrook	Norfolk	22	10,791
Colrain	Franklin	2	1,671	Holden	Worcester	8	17,346

Table A1. Population Estimates[1] for Massachusetts Communities, 2010, continued

TOWN NAME	COUNTY	CHNA	POPULATION	TOWN NAME	COUNTY	CHNA	POPULATION
Holland	Hampden	5	2,481	New Marlborough	Berkshire	1	1,509
Holliston	Middlesex	7	13,547	New Salem	Franklin	2	990
Holyoke	Hampden	21	39,880	Newbury	Essex	12	6,666
Hopedale	Worcester	6	5,911	Newburyport	Essex	12	17,416
Hopkinton	Middlesex	7	14,925	Newton	Middlesex	18	85,146
Hubbardston	Worcester	9	4,382	Norfolk	Norfolk	7	11,227
Hudson	Middlesex	7	19,063	North Adams	Berkshire	1	13,708
Hull	Plymouth	20	10,293	North Andover	Essex	11	28,352
Huntington	Hampshire	21	2,180	North Attleboro	Bristol	24	28,712
Ipswich	Essex	13	13,175	North Brookfield	Worcester	5	4,680
Kingston	Plymouth	23	12,629	North Reading	Middlesex	16	14,892
Lakeville	Plymouth	24	10,602	Northampton	Hampshire	3	28,549
Lancaster	Worcester	9	8,055	Northborough	Worcester	7	14,155
Lanesborough	Berkshire	1	3,091	Northbridge	Worcester	6	15,707
Lawrence	Essex	11	76,377	Northfield	Franklin	2	3,032
Lee	Berkshire	1	5,943	Norton	Bristol	24	19,031
Leicester	Worcester	8	10,970	Norwell	Plymouth	20	10,506
Lenox	Berkshire	1	5,025	Norwood	Norfolk	20	28,602
Leominster	Worcester	9	40,759	Oak Bluffs	Dukes	27	4,527
Leverett	Franklin	2	1,851	Oakham	Worcester	9	1,902
Lexington	Middlesex	15	31,394	Orange	Franklin	2	7,839
Leyden	Franklin	2	711	Orleans	Barnstable	27	5,890
Lincoln	Middlesex	15	6,362	Otis	Berkshire	1	1,612
Littleton	Middlesex	15	8,924	Oxford	Worcester	5	13,709
Longmeadow	Hampden	4	15,784	Palmer	Hampden	4	12,140
Lowell	Middlesex	10	106,519	Paxton	Worcester	8	4,806
Ludlow	Hampden	21	21,103	Peabody	Essex	14	51,251
Lunenburg	Worcester	9	10,086	Pelham	Hampshire	3	1,321
Lynn	Essex	14	90,329	Pembroke	Plymouth	23	17,837
Lynnfield	Essex	14	11,596	Pepperell	Middlesex	9	11,497
Malden	Middlesex	16	59,450	Peru	Berkshire	1	847
Manchester	Essex	13	5,136	Petersham	Worcester	2	1,234
Mansfield	Bristol	24	23,184	Phillipston	Worcester	2	1,682
Marblehead	Essex	14	19,808	Pittsfield	Berkshire	1	44,737
Marion	Plymouth	26	4,907	Plainfield	Hampshire	3	648
Marlborough	Middlesex	7	38,499	Plainville	Norfolk	7	8,264
Marshfield	Plymouth	23	25,132	Plymouth	Plymouth	23	56,468
Mashpee	Barnstable	27	14,006	Plympton	Plymouth	23	2,820
Mattapoisett	Plymouth	26	6,045	Princeton	Worcester	9	3,413
Maynard	Middlesex	7	10,106	Provincetown	Barnstable	27	2,942
Medfield	Norfolk	7	12,024	Quincy	Norfolk	20	92,271
Medford	Middlesex	16	56,173	Randolph	Norfolk	20	32,112
Medway	Norfolk	6	12,752	Raynham	Bristol	24	13,383
Melrose	Middlesex	16	26,983	Reading	Middlesex	16	24,747
Mendon	Worcester	6	5,839	Rehoboth	Bristol	24	11,608
Merrimac	Essex	12	6,338	Revere	Suffolk	19	51,755
Methuen	Essex	11	47,255	Richmond	Berkshire	1	1,475
Middleborough	Plymouth	24	23,116	Rochester	Plymouth	26	5,232
Middlefield	Hampshire	3	521	Rockland	Plymouth	23	17,489
Middleton	Essex	11	8,987	Rockport	Essex	13	6,952
Milford	Worcester	6	27,999	Rowe	Franklin	2	393
Millbury	Worcester	8	13,261	Rowley	Essex	12	5,856
Millis	Norfolk	7	7,891	Royalston	Worcester	2	1,258
Millville	Worcester	6	3,190	Russell	Hampden	4	1,775
Milton	Norfolk	20	27,003	Rutland	Worcester	9	7,973
Monroe	Franklin	2	121	Salem	Essex	14	41,340
Monson	Hampden	4	8,560	Salisbury	Essex	12	8,283
Montague	Franklin	2	8,437	Sandisfield	Berkshire	1	915
Monterey	Berkshire	1	961	Sandwich	Barnstable	27	20,675
Montgomery	Hampden	4	838	Saugus	Essex	14	26,628
Mt. Washington	Berkshire	1	167	Savoy	Berkshire	1	692
Nahant	Essex	14	3,410	Scituate	Plymouth	20	18,133
Nantucket	Nantucket	27	10,172	Seekonk	Bristol	24	13,722
Natick	Middlesex	7	33,006	Sharon	Norfolk	20	17,612
Needham	Norfolk	18	28,886	Sheffield	Berkshire	1	3,257
New Ashford	Berkshire	1	228	Shelburne	Franklin	2	1,893
New Bedford	Bristol	26	95,072	Sherborn	Middlesex	7	4,119
New Braintree	Worcester	9	999	Shirley	Middlesex	9	7,211

Table A1. Population Estimates[1] for Massachusetts Communities, 2010, continued

TOWN NAME	COUNTY	CHNA	POPULATION
Shrewsbury	Worcester	8	35,608
Shutesbury	Franklin	2	1,771
Somerset	Bristol	25	18,165
Somerville	Middlesex	17	75,754
South Hadley	Hampshire	3	17,514
Southampton	Hampshire	3	5,792
Southborough	Worcester	7	9,767
Southbridge	Worcester	5	16,719
Southwick	Hampden	4	9,502
Spencer	Worcester	5	11,688
Springfield	Hampden	4	153,060
Sterling	Worcester	9	7,808
Stockbridge	Berkshire	1	1,947
Stoneham	Middlesex	16	21,437
Stoughton	Norfolk	22	26,962
Stow	Middlesex	7	6,590
Sturbridge	Worcester	5	9,268
Sudbury	Middlesex	7	17,659
Sunderland	Franklin	2	3,684
Sutton	Worcester	6	8,963
Swampscott	Essex	14	13,787
Swansea	Bristol	25	15,865
Taunton	Bristol	24	55,874
Templeton	Worcester	9	8,013
Tewksbury	Middlesex	10	28,961
Tisbury	Dukes	27	3,949
Tolland	Hampden	4	485
Topsfield	Essex	13	6,085
Townsend	Middlesex	9	8,926
Truro	Barnstable	27	2,003
Tyngsborough	Middlesex	10	11,292
Tyringham	Berkshire	1	327
Upton	Worcester	6	7,542
Uxbridge	Worcester	6	13,457
Wakefield	Middlesex	16	24,932
Wales	Hampden	5	1,838
Walpole	Norfolk	7	24,070
Waltham	Middlesex	18	60,632
Ware	Hampshire	3	9,872
Wareham	Plymouth	26	21,822
Warren	Worcester	5	5,135
Warwick	Franklin	2	780
Washington	Berkshire	1	538
Watertown	Middlesex	17	31,915
Wayland	Middlesex	7	12,994
Webster	Worcester	5	16,767
Wellesley	Norfolk	18	27,982
Wellfleet	Barnstable	27	2,750
Wendell	Franklin	2	848
Wenham	Essex	13	4,875
West Boylston	Worcester	8	7,669
West Bridgewater	Plymouth	22	6,916
West Brookfield	Worcester	5	3,701
West Newbury	Essex	12	4,235
West Springfield	Hampden	4	28,391
West Stockbridge	Berkshire	1	1,306
West Tisbury	Dukes	27	2,740
Westborough	Worcester	7	18,272
Westfield	Hampden	21	41,094
Westford	Middlesex	10	21,951
Westhampton	Hampshire	3	1,607
Westminster	Worcester	9	7,277
Weston	Middlesex	18	11,261
Westport	Bristol	25	15,532
Westwood	Norfolk	18	14,618
Weymouth	Norfolk	20	53,743
Whately	Franklin	2	1,496
Whitman	Plymouth	22	14,489
Wilbraham	Hampden	4	14,219
Williamsburg	Hampshire	3	2,482
Williamstown	Berkshire	1	7,754
Wilmington	Middlesex	15	22,325
Winchendon	Worcester	9	10,300
Winchester	Middlesex	15	21,374
Windsor	Berkshire	1	899
Winthrop	Suffolk	19	17,497
Woburn	Middlesex	15	38,120
Worcester	Worcester	8	181,045
Worthington	Hampshire	3	1,156
Wrentham	Norfolk	7	10,955
Yarmouth	Barnstable	27	23,793

1. MDPH Massachusetts Race Allocated Census 2010 Estimates (MRACE 2010).

Table A2. Population Estimates[1] for Massachusetts Community Health Network Areas (CHNAs) and Counties: 2010

CHNA	POPULATION[1]	COUNTY	POPULATION[1]
1. Community Health Network of Berkshire County	131,219	Barnstable	215,888
2. Upper Valley Health Web	87,130	Berkshire	131,219
3. Partnership for Health in Hampshire County	155,900	Bristol	548,285
4. The Community Health Connection	296,850	Dukes	16,535
5. South County Connects	119,539	Essex	743,159
6. Community Partners for Health	166,824	Franklin	71,372
7. Community Health Coalition of Metro	388,909	Hampden	463,490
8 .Common Pathways	309,013	Hampshire	158,080
9. CHN of North Central Massachusetts	262,652	Middlesex	1,503,085
10. The Greater Lowell CHNA	275,404	Nantucket	10,172
11. The Greater Lawrence CHNA	194,172	Norfolk	670,850
12. The Greater Haverhill CHNA	148,563	Plymouth	494,919
13. The North Shore CHN (Beverly/Gloucester Area)	115,782	Suffolk	722,023
14. The North Shore CHN (Salem/Lynn Area)	284,642	Worcester	798,552
15. Northwest Suburban Health Alliance	215,757		
16. North Suburban Health Alliance	270,281	**STATE**	**6,547,629**
17. The Greater Cambridge/Somerville CHNA	280,404		
18. West Suburban Health Network	258,843		
19. Boston Alliance for Community Health	780,755		
20. Blue Hills Community Health Alliance	377,279		
21. CHN of Holyoke, Chicopee, Ludlow, Westfield	160,892		
22. The Greater Brockton CHNA	236,778		
23. South Shore CHN	190,549		
24. The Greater Attleboro-Taunton CHNA	256,322		
25. Partners for Healthier Communities	138,419		
26. Greater New Bedford CHN	202,156		
27. Cape and Islands Health Network	242,595		

1. MDPH Massachusetts Race Allocated Census 2010 Estimates (MRACE 2010).

Glossary

Adequacy of Prenatal Care Utilization (APNCU) Index
The Adequacy of Prenatal Care Utilization Index, developed by Dr. Milton Kotelchuck, is the measure used in this publication to classify the adequacy of prenatal care received by Massachusetts resident mothers. (*Please note:* Prior to the *Births 2001 publication, the Kessner Index was used to measure adequacy of prenatal care; please see definition for Kessner Index below*.) The APNCU Index has five categories (adequate intensive, adequate basic, intermediate, inadequate, and unknown), based on the month of pregnancy in which prenatal care begins and the percent of expected prenatal care visits for the time period during which a woman receives prenatal care services. Please see Technical Notes for more details.

Birthweight
The weight of an infant recorded at the time of delivery. It may be recorded in either pounds/ounces or grams. If recorded in pounds/ounces, it is converted to grams for use in this report.

1 pound = 453.6 grams
1,000 grams = 2 pounds and 3 ounces

Birthweight Categories

Normal birthweight (NBW):	An infant's weight of 2,500 grams (approximately 5.5 pounds) or more recorded at birth.
Low birthweight (LBW):	An infant's weight of less than 2,500 grams (5.5 pounds) recorded at birth.
Very low birthweight (VLBW):	An infant's weight of less than 1,500 grams (3.3 pounds) recorded at birth.

Cesarean Delivery or Cesarean Section (C-Section)
Primary: A mother's first cesarean delivery.
Repeat: A cesarean delivery that has been preceded by at least one Cesarean delivery.

Community Health Network Areas (CHNAs)
The Department of Public Health, in collaboration with health service providers, coalition members, and interested citizens, has designated 27 areas for community health planning. It is the Department's intention to foster in each of these areas the development of Community Health Networks – consortia of health care providers, human service agencies, schools, churches, youth, parents, elders, advocacy groups, and individual consumers – to address the health needs of the community. These community coalitions will participate in monitoring outcomes and progress of strategies and responses to those health needs.

It is hoped the Networks will mobilize around key health issues affecting the community, promote prevention efforts, enhance access to care, provide opportunities for more collaboration among agencies, and create a client-centered, outcome-oriented health service delivery system. Community Health Networks will also promote efficiency in service delivery by working to reduce duplication and overlap, and by identifying gaps in service.

A Community Health Network Area (CHNA) is defined as an aggregation of cities and towns. In the current publication, we have presented some data by CHNA. To determine which cities and towns make up a particular CHNA, Table A1 provides the appropriate CHNA code for each city and town. The data published in this volume reflect the definitions of CHNAs instituted in January 1997 and the corresponding CHNA names.

Confidence Intervals
The confidence interval (CI) for the infant mortality rate (IMR) is a range of values that has a 95% chance of including the underlying risk of an infant death. Observed rates are subject to statistical variation; even if the underlying risk of infant death is identical in two subpopulations, the observed IMRs for the subpopulations may differ because of random variation. The confidence interval describes the precision of observed IMR as an estimate of the underlying risk of infant death, with a wider interval indicating less certainty about this estimate. The width of the interval reflects the size of the subpopulation and the number of infant deaths; smaller subpopulations with fewer infant deaths lead to wider confidence intervals.

Death Cohort Linked File or Linked Birth and Infant Death File – Death Cohort
All infant deaths occurring in a specific year have been linked to their corresponding birth certificates, whether the birth occurred during the same year or in the previous one. This is in contrast to a birth cohort linked file, in which infant deaths may have occurred in the same year or in the year following the year of birth.

Delivery
A delivery may consist of one or more live born or stillborn fetuses. The number of deliveries in a given period will be equal to or less than the number of births because multiple births (twins, triplets or higher–order births) are counted as single deliveries.

EOHHS Regions
The six regions delineated by the commonwealth's Executive Office of Health and Human Services and used by the Department of Public Health for statistical, care coordination and administrative purposes. The regions - Western, Central, Northeast, Metro West, Boston and Southeast - are based on geographical groupings of cities and towns.

Ethnicity
Also known as mother’s ancestry. See the section in the Technical Notes of the Appendix entitled: “Changes in the Collection of Race and Ethnicity Information.”

Fetal Death
A stillbirth delivered, extracted or expulsed at 20 weeks gestation or more or weighs 350 grams or more.

Feto-Infant Mortality Rate
The combined number of fetal deaths and infant deaths per 1,000 live births and fetal deaths.

Gestational Age (GA)
The developmental period of a fetus from time of conception to time of birth, measured in weeks. There are two main methods for determining gestational age used in this report.

1. Clinical estimate of gestational age. The gestational age is determined by a physical examination and neuromuscular assessment of the newborn. All gestational age statistics in this report are based upon this method, with the exception of the data in Table 14 for Preterm %, which is calculated based upon the last menstrual period.
2. Last Menstrual Period. The gestational age is calculated as the interval between the first day of the mother's last normal menstrual period (LMP) and the infant's date of birth.

The National Center for Health Statistics uses this method for determining preterm as is shown in Table 14.

Indicators that are based upon gestational age, such as percent preterm births, vary depending upon with method is used in their calculation. Using the LMP method as the NCHS does, makes the percent preterm births higher (10.7%, 2010); while using the clinical estimate of gestational age causes a lower value for percent preterm births (8.6%, 2010). The reader must be aware of the method of calculating gestational age when evaluating the preterm percentages.

Some groups of GA used in this report are:

Preterm: infant born with less than 37 weeks of gestation
Late Preterm: infant born between 34th and 36th week of gestation
Term: infant born at 37th week of gestation or later
Early Term: infant born between 37th and 38th week of gestation

Healthy Start
A Massachusetts-funded program providing services and financing for prenatal care to low-income pregnant women who lack health insurance, but do not qualify for Medicaid.

Infant
A child whose age is less than one year (365 days).

Infant Death
Death of a child whose age is less than one year.

Kessner Index (Adequacy of Prenatal Care)
A measure of adequacy of prenatal care, used in *Advance Data: Births* and *Massachusetts Births* publications prior to 2001. The Kessner Index classifies prenatal care as one of 5 categories (adequate, intermediate, inadequate, no prenatal care, and unknown), based on the trimester in which prenatal care began and the number of prenatal visits. The classification adjusts for gestational age to allow for proper classification of premature births, and is as follows:

Category	Trimester Care Began	Number of Visits
Adequate	1	9 or more
Intermediate	1	5-8
	2	5 or more
Inadequate	1	1-4
	2	1-4
	3	1 or more
No prenatal care	--	0
Unknown	Unknown	Unknown

Live Birth
A live birth is any infant who breathes or shows any other evidence of life (such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles) after separation from the mother's uterus, regardless of the duration of gestation.

Low Birthweight (LBW)
See Birthweight Categories.

Maternal Death
The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes.

Mother's Birthplace
In this publication, birth characteristics are presented according to mother's birthplace: those who were born in the 50 states and District of Columbia, or "US States / D.C."; those who were born in Puerto Rico, the US Virgin Islands, and Guam, or "Puerto Rico/US Territories"; and those who were born outside of the US and Puerto Rico/US territories, or "Non-US-born".

Neonate
Infants under 28 days of age.

Neonatal Death
Death of a child whose age is less than 28 days.

Non-US-born Women
See Mother's Birthplace.

Occurrence Birth
A birth occurring in the Commonwealth of Massachusetts, regardless of the residency of the mother. For individual cities/towns, an occurrence birth represents any birth occurring in that city/town, regardless of the residence of the mother. See Resident Birth.

Parity
The total number of live infants ever born to a woman, including the current birth.

Perinatal
Referring to the time period immediately before and after birth (28 weeks of gestation to 7 days after birth).

Perinatal Death
Death to a fetus of 28 weeks gestation or older or a live-born infant less than 7 days old.

Plurality
The number of births to a woman produced in the same gestational period. A singleton is the birth of one infant; twins represent the births of two infants, etc.

Post Neonatal
A child whose age is at least 28 days, but less than one year.

Post Neonatal Death
Death of a child whose age is at least 28 days, but less than one year.

Prenatal Care Source of Payment
Categories used in this publication include:

Public = Government programs including CommonHealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care;
Private = Commercial indemnity plan, commercial managed care (HMO, PPO, IPP, IPA, and other), or other private insurance;

Other = Worker's Compensation and other sources;
Self-paid.

Pregnancy-Associated Death
The death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause.

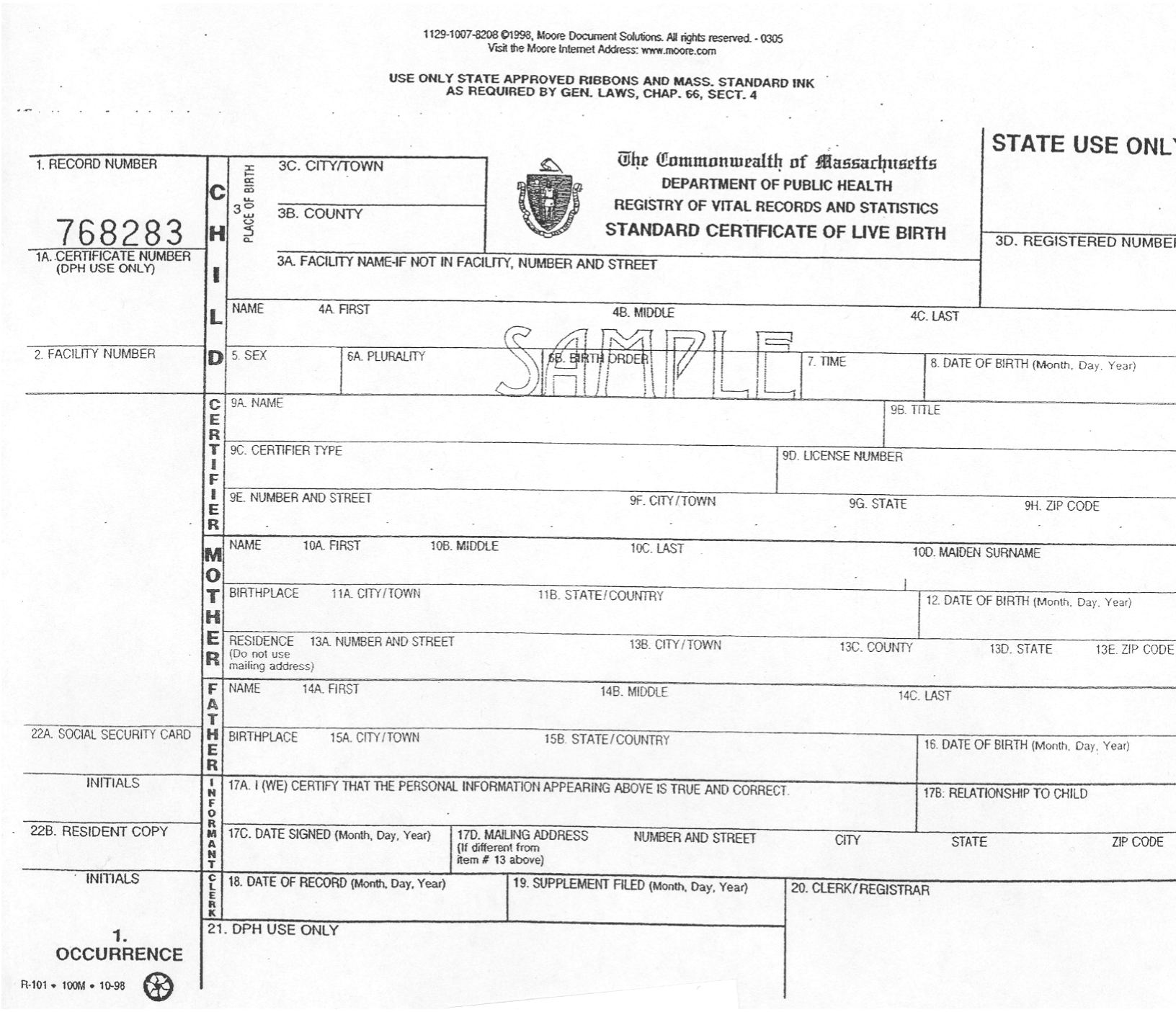
Race
See the section in the Technical Notes in the Appendix entitled: "Changes in the Collection of Race and Ethnicity Information."

Resident Birth
The birth of an infant whose mother reports that her usual place of residence is in Massachusetts. In Massachusetts, a resident is a person with a permanent address in one of the 351 cities or towns. Vital statistics data may be presented in terms either of residence or occurrence. All data in this publication are resident data unless otherwise stated. Resident data include all events that occur to residents of the Commonwealth, wherever they occur. Occurrence data include all events that occur within the state, whether to residents or nonresidents. There is an exchange agreement among the 50 states, District of Columbia, Puerto Rico, Virgin Islands, Guam, and Canadian provinces that provides for exchange of copies of birth and death records. These records are used for statistical purposes only, and allow each state or province to track the births and deaths of its residents.

Vaginal Birth After Cesarean (VBAC)
A vaginal delivery of an infant to a mother who has had at least one prior cesarean delivery.

Very Low Birthweight (VLBW)
An infant's weight of less than 1,500 grams (3.3 pounds) recorded at birth.

Massachusetts Birth Certificate: 2010



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AS REQUIRED BY GEN. LAWS, CHAP. 66, SECT. 4

The Commonwealth of Massachusetts
DEPARTMENT OF PUBLIC HEALTH
REGISTRY OF VITAL RECORDS AND STATISTICS
STANDARD CERTIFICATE OF LIVE BIRTH

STATE USE ONLY

1. RECORD NUMBER
768283
1A. CERTIFICATE NUMBER (DPH USE ONLY)

2. FACILITY NUMBER

CHILD

3. PLACE OF BIRTH
3C. CITY/TOWN
3B. COUNTY
3A. FACILITY NAME-IF NOT IN FACILITY, NUMBER AND STREET
3D. REGISTERED NUMBER

NAME 4A. FIRST 4B. MIDDLE 4C. LAST

SAMPLE

5. SEX | 6A. PLURALITY | 6B. BIRTH ORDER | 7. TIME | 8. DATE OF BIRTH (Month, Day, Year)

CERTIFIER

9A. NAME | 9B. TITLE
9C. CERTIFIER TYPE | 9D. LICENSE NUMBER
9E. NUMBER AND STREET | 9F. CITY/TOWN | 9G. STATE | 9H. ZIP CODE

MOTHER

NAME 10A. FIRST 10B. MIDDLE 10C. LAST 10D. MAIDEN SURNAME

BIRTHPLACE 11A. CITY/TOWN 11B. STATE/COUNTRY | 12. DATE OF BIRTH (Month, Day, Year)

RESIDENCE (Do not use mailing address) 13A. NUMBER AND STREET | 13B. CITY/TOWN | 13C. COUNTY | 13D. STATE | 13E. ZIP CODE

FATHER

NAME 14A. FIRST 14B. MIDDLE 14C. LAST

BIRTHPLACE 15A. CITY/TOWN 15B. STATE/COUNTRY | 16. DATE OF BIRTH (Month, Day, Year)

22A. SOCIAL SECURITY CARD

INITIALS

INFORMANT

17A. I (WE) CERTIFY THAT THE PERSONAL INFORMATION APPEARING ABOVE IS TRUE AND CORRECT. | 17B. RELATIONSHIP TO CHILD

22B. RESIDENT COPY

17C. DATE SIGNED (Month, Day, Year) | 17D. MAILING ADDRESS (If different from item # 13 above) NUMBER AND STREET | CITY | STATE | ZIP CODE

INITIALS

CLERK

18. DATE OF RECORD (Month, Day, Year) | 19. SUPPLEMENT FILED (Month, Day, Year) | 20. CLERK/REGISTRAR

1. OCCURRENCE

21. DPH USE ONLY

R-101 • 100M • 10-98

Massachusetts Births 2010 Evaluation Form

TO OUR READERS:
In an attempt to better serve our users, we are enclosing this evaluation form. Please take the time to complete this questionnaire and return it to the address at the bottom of the page. Thank you.

What tables and charts do you find most useful?
What tables and charts do you find least useful?
Are there other tables and charts that you would like added to this publication? If yes, please describe them in detail.
Do you have other comments or suggestions?
Name (optional): **Address:** **(For those who received the publication by mail)** Is the mailing label address correct? If not, please correct the address. Thank you.

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